BUREAU OF HYGIENE AND TROPICAL DISEASES.

TROPICAL DISEASES BULLETIN.

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KALA AZAR.

INDIAN MEDICAL RESEARCH MEMOIRS. Supplementary Series to the *Indian Journal of Medical Research.* 1926. Feb. Memoir No 4. pp. iv. + 288. With numerous illustrations. **Reports of the Kala-Azar Commission, India. Report No. 1. (1924-25.)**

Much of the information contained in this report, the first issued by the Commission now working in India on the kala azar problem, has already been published and noted in this *Bulletin.* In the Introduction, S.R. CHRISTOPHERS, who was for some time Director of the Commission in Assam, gives a most useful account of the present distribution of kala azar, especially with reference to the factors which appear to regulate its occurrence and spread, as also a summary of the main results so far obtained by the Commission in Assam and by the " Kala Azar Ancillary Enquiry " in Calcutta.

The present position held by the Commission that the sandfly is most probably the vector of kala azar has not been taken up precipitately, but has followed a definite line of work which aimed at a logical and systematic investigation of the whole field. The fact that careful investigations had failed to incriminate numerous blood-sucking Arthropoda—particularly the bed-bug, louse and flea, as also intestinal helminths, rather tended to check enthusiasm for the insect-borne hypothesis of kala azar. There was, however, some suspicion that it was just possible that the bed-bug was concerned or that some undiscovered arthropod was the host, or that infection was by way of the alimentary canal. It would be expected that the parasite of kala azar outside the body would be even more delicate than that of typhoid, a disease which, in its tendency to explosive outbreak associated with slow spread from case to case, resembles kala azar in many respects. The slow spread in typhoid has been shown to depend on the degree of humidity ; hence it might be expected that kala azar would not be transmissible except under very special meteorological conditions. Falling in with such a theory would be the close family and site connexion of cases of the disease as seen in India. If, however, such were the method of spread, then the parasite should be able to survive in watery solutions and to cause infection by way of the alimentary canal. Investigations undertaken along these lines have shown that though viable parasites escape in the urine, there is an increasing improbability that the parasite would be able to behave in a manner

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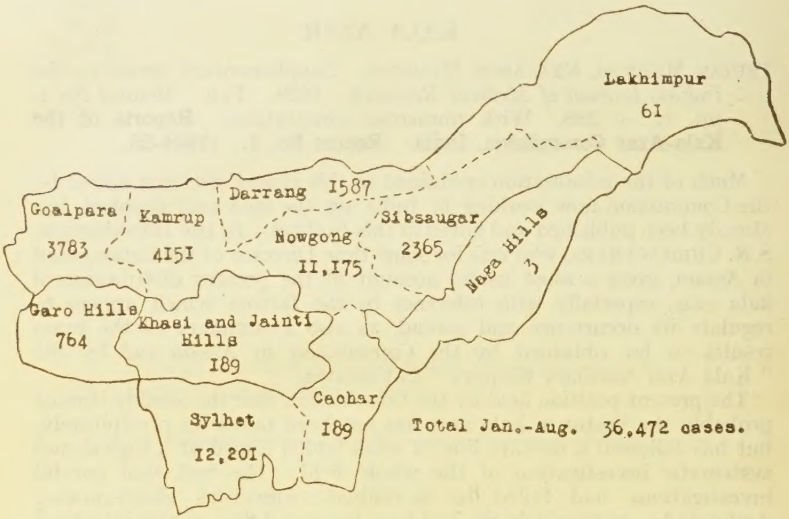
capable of leading to infection by the mouth. Careful experiments with mice, recorded in the report, are most decisive and demonstrate that it is highly improbable that infection can be produced in this way. The inability of the parasite to adopt the flagellate stage except under very special circumstances affords a further argument against this view.

As regards the distribution of kala azar in India, NAPIER points out that it is associated with one set of physical circumstances, viz., the existence of alluvium and a certain heaviness of rainfall. Furthermore, the distribution is distinctly suggestive of a fauna relationship but not of any one known species of blood-sucking host, though in India, as pointed out by SINTON, the distribution of the disease coincides very closely with that of *Phlebotomus argentipes*. If, however, the sandfly is the vector, then to account for the occurrence of kala azar in other countries more than one species of *Phlebotomus* must be involved.



Map of Assam showing number of cases of Kala azar treated between January and August, 1924.

[Reproduced from *Indian Medical Research Memoirs*.]

The areas of India where kala azar is most widespread are those comprised in the eastern portion of the Indo-Gangetic plain and the Valley of the Brahmaputra. The real extent of the prevalence in these parts has only been brought to light since the institution of treatment centres. As these centres only draw a part of the cases from a limited circle, it is clear that the figures illustrated in the map represent only a small proportion of the total.

The map shows that kala azar affects almost every district within the area. It does not, however, occur above a certain altitude, for Shillong at a height of 4,000 feet appears to be free.

In Assam, as in a large part of Bengal, the villages consist for the most part of isolated homesteads 50 to 100 yards apart in the midst of rice fields, patches of jungle and bamboo groves. It is only for

administrative purposes that numbers of such homesteads are delimited as a village. There is a very definite house infection, which in many cases is traceable to the introduction of a relative or other person from a known, previously infected house, and there is reason to believe that, once introduced, kala azar does not disappear until the whole of the population in the focus has been destroyed.

The arrangements of the typical house seem to have little to do with the question of kala azar transmission, nor does there seem to be anything significant about the simple domestic arrangements. The associations of kala azar in Assam are essentially jungle, but such surroundings are not necessary for transmission of the disease. The fact that young children who are frequently infected practically never leave the precincts of the house is in direct opposition to the view that a jungle inhabiting blood-sucking insect is the vector. A feature that cannot fail to be noticed in Assam is the extraordinarily high humidity and stillness of the air associated with a uniformly moderate temperature. In Madras, however, the conditions are entirely different. In the place of isolated lightly-built houses are densely packed small masonry habitations. It is of especial interest that BARRAUD in his paper in the report finds that *Phlebotomus argentipes* occurs abundantly under these circumstances.

Though the work of the Commission started on somewhat generalized lines, the discovery by the Ancillary Enquiry in Calcutta that the parasite developed readily in the sandfly focussed attention on this insect. It has been found, as already noted in this *Bulletin*, that after feeding on kala azar cases the parasite flagellates and increases rapidly in numbers till the whole mid-gut becomes infected. Anteriorly in some flies the infection spreads to the pharynx and even the buccal cavity.

The above summary gives the most important results obtained by the Commission. Individual papers not hitherto noted in this *Bulletin* give in detail the investigations undertaken. CHRISTOPHERS, SHORTT and BARRAUD describe their observations on the morphology and life-cycle of the parasite of Indian kala azar in culture. They note that the tissue form of the organism is definitely orientated as regards the position of the nucleus, parabasal, rhizoplast and flagellar vacuole so that dorsal and ventral surfaces and anterior and posterior ends can be distinguished. A similar orientation is applicable to the flagellate stage. The same authors, in two papers, describe their experiments directed to the infection of mice by intraperitoneal inoculation of cultures of *L. donovani* and the results obtained by feeding mice with cultures. It is noted that primary cultures of an age of seven days or more almost invariably produce infection when injected intraperitoneally. Younger cultures are probably incapable of doing so. The intensity of the infection was in direct proportion to the dose of virus employed and during the period of observation the infection showed no tendency to spontaneous disappearance. As regards the attempts at oral infection, with one exception, where a fallacy may have been introduced, the experiments were uniformly negative. Two other papers by the above mentioned authors and one by NAPIER and SMITH give some further details regarding feeding experiments with *Phlebotomus argentipes*, the main results of which have alerady been noted, CHRISTOPHERS, SHORTT and BARRAUD in another paper describe attempts made to infect larvae of *P. argentipes* with cultural forms of *L. donovani*. The

larvae after feeding on the cultures were allowed to pupate and hatch, but the emerging flies showed no infection. NAPIER and SMITH contribute a paper on the bionomics of *P. argentipes* in Calcutta under the headings habitat, feeding, flight, breeding, prevalence, effect of temperature and humidity, effect of rain, normal life cycle, humidity, temperature, food, natural enemies and parasitic infections. As regards habitat, the places where flies were caught are cattle sheds, human sleeping quarters and chicken houses. The first of these yielded the largest number of flies, though sometimes as many as 30 flies were caught in a single sleeping room. Though the flies were never observed in horse stables, they sometimes occur in unusual places as illustrated by one fly caught in a tree in the Zoological Gardens. The adult

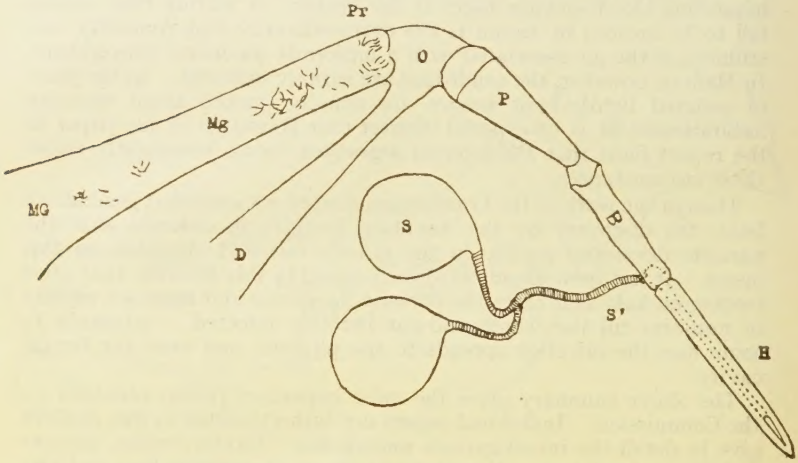


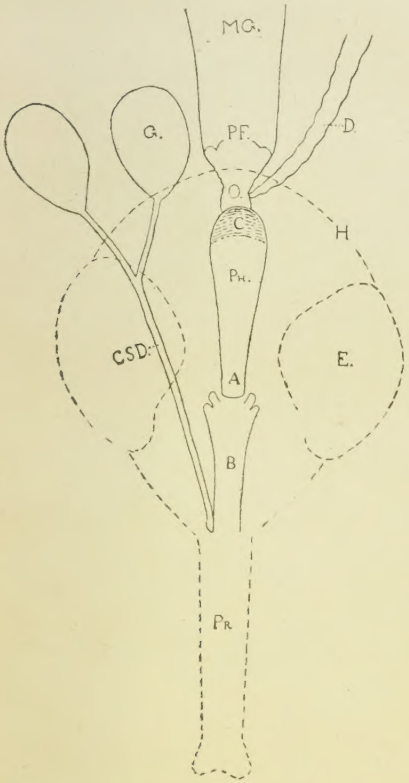
Diagram showing appearance of parts in dissected sandfly.

MG = Midgut.
Mg = Narrow anterior part of same.
Pr = Proventricular fold.
O = Membranous oesophagus.
D = Diverticulum of same.
P = Chitinous pharynx or pumping organ.
B = Chitinous buccal cavity.
H = Hypostome : other mouth parts not shown, opening of salivary duct at end.
S = One of the two salivary glands.
S' = Common salivary duct ending in salivary pump at base of hypostome.

[Reproduced from *Indian Medical Research Memoirs.*]

female is a pure blood feeder, the males never showing anything in the intestine but remains of the larval feed. The female chooses either man or the cow, preferably the latter. The flight of the fly is very limited, for it moves but a few inches when disturbed. They have never been found in unused rooms or far from the food supply, nor in upper rooms of a house. Larvae have been found on five occasions. Twice in rooms the floors of which were covered with earth and fowl droppings, once in material collected from a fowl box, once in a godown in which goats were kept and once in a rat-hole in a room. Pupae were found

with the larvae on two occasions. The flies have been caught throughout every month of the year. The number appeared to be reduced with cold and lowered humidity. Actual rain appeared to increase the numbers caught, probably as a result of flies seeking shelter indoors. In the laboratory the whole cycle occupies about 30 days ; ova 4 days, larvae 14 days, pupae 7 days. The female feeds on the second day, and if fertilized oviposits on the 5th or 6th day and dies immediately. If fertilization does not take place a second feed is taken by some on the 5th day and they survive to the 9th or 10th day. Rarely a fly will



Diagrammatic representation of dissected head of *Phlebotomus argentipes* showing the approximate relation of important parts.

MG = Anterior end of midgut.
PF = Proventricular fold.
O = Oesophagus.
D = Diverticulum.
C = Crinkly posterior part of pharynx.
Ph = Pharynx.
A = Anterior end of pharynx.
B = Buccal cavity.
G = Salivary glands (shown displaced to one side).
CSD = Common salivary duct.
Pr = Outline of proboscis.
E = Outline of eye.
H = Outline of head.

MG, PF, O, D, C, Ph, A and B are situations where flagellates have been found.

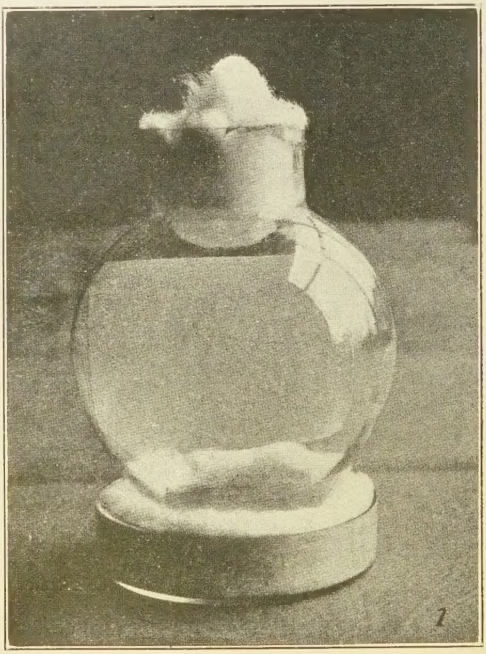
[Reproduced from *Indian Medical Research Memoirs.*]

take a third feed and survive to the 15th day. Ova and larvae require a very high degree of humidity, but the pupae do not require this. The lowest recorded temperatures of Calcutta did not kill either the eggs or larvae. The larvae appear to thrive best on dried rabbit's faeces and dried human blood. They would live on fowl faeces and numerous batches were fed after the first instar on dead adult sandflies. Natural enemies of the larvae are mites, while ants and cockroaches destroy them if they gain access to the breeding trays. Spiders catch adult flies in their webs. Geckos were seldom present on the walls where flies were caught. Parasites which occur in *P. argentipes* include a

gregarine in the larvae and adults, and flagellates—a species of *Bodo* and what appeared to be a *Crithidia*. Rhabidiform larvae and adult nematodes were also observed in the fly.

CHRISTOPHERS, SHORTT and BARRAUD give an illustrated account of the anatomy of the head and mouth parts of the adult fly, while BARRAUD contributes a report on a sandfly survey of Madras Town. Four species of Phlebotomus (*P. argentipes, P. minutus, P. squamipleuris* and *P. papatasii*) were present, the first being by far the commonest.

The same authors describe the technique employed by them in breeding *P. argentipes* in Assam. The gravid female flies are placed in a receptacle consisting of a globular lamp glass standing in a Petri dish



A simple apparatus in which large numbers of *P. argentipes* have been successfully reared from the egg.

[Reproduced from *Indian Medical Research Memoirs.*]

in which have been placed several thicknesses of damp filter paper. On the filter paper is spread a quantity of rabbit or goat's faeces previously heated to 60° C. for an hour to kill fly larvae, mites and other predaceous creatures. The upper opening of the glass is closed with a plug of cotton wool while the space between the glass and the rim of the dish is packed with the same material. The filter paper and cotton wool must be kept in a thoroughly damp condition and the whole apparatus maintained at 24° C. After eggs have been laid the dish is removed and covered with its lid and kept at the same temperature. The eggs hatch in about a week, the larvae hiding themselves in the food material. They must be kept in the dark and the food moistened if

necessary every day till towards the end of the second week when pupation commences. The pupal stage lasts 7 to 8 days. The flies which emerge are then transferred to a small cage made of muslin. Finally NAPIER'S article on epidemiological considerations of the transmission of kala azar shows that every observation appears to be in keeping with the theory that *P. argentipes* is the transmitter of the causative organism of kala azar. The fly is not observed above 2,000 feet and its development is dependent on a high humidity and a moderate steady temperature ; the high subsoil water level and alluvial soil help the maintenance of the necessary humidity throughout the drier months of the year.

C. M. Wenyon.

CHRISTOPHERS (S. R.). Recherches sur le kala-azar dans l'Inde Britannique. [**Researches on Kala Azar in British India.**]—*Bull. Office Internat. d'Hyg. Publique.* 1926. Mar. Vol. 18. No. 3. pp. 271-272. [1 ref.]

This note gives a summary of work carried out with *Phlebotomus argentipes*. Kala azar in India is most common in Bihar, Bengal and Assam with a population of about 100,000,000. In 1924 more than 100,000 cases were treated in Bengal and Assam, but these represent but a small proportion of those suffering from the disease.

C. M. W.

SHORTT (H. E.), BARRAUD (P. J.) & CRAIGHEAD (A. C.). **Note on a Massive Infection of the Pharynx of** *Phlebotomus argentipes* **with** *Herpetomonas donovani*.—*Indian Jl. Med. Res.* 1926. Jan. Vol. 13. No. 3. pp. 441-444. With 1 plate and 1 text fig. [1 ref.] Also *Indian Med. Res. Memoirs.* 1926. Feb. Memoir No. 4. pp. 157-160.

This paper describes further results of experiments with *Phlebotomus argentipes* and kala-azar. Three flies, which had fed twice on cases of kala azar and were dissected on the eighth day after the first feed, were found to have a massive infection of the proximal end of the pharynx. By cutting serial sections of the heads of two of these flies, the exact distribution of the flagellates was noted. In a note to the paper two other similar infections are described, the flagellates extending into the buccal cavity, in close proximity to the commencement of the biting parts. Of another series of fourteen fifth-day flies sectioned, four showed infection of the mid gut, six infection of the mid gut and pharynx, and four were entirely negative. It is stated that these findings appear " to be all that is required, short of the final proof of a transmission experiment, to demonstrate that kala azar is transmitted by the bite of the sandfly."

The paper is illustrated with a diagram of the dissected head of the sandfly and a drawing showing the flagellates in the pharynx and buccal cavity.

C. M. W.

RAMAN (T. K.). **Kala-Azar.**—*Madras Med. College Mag.* 1926. Vol. 5. No. 3. pp. 185-194.

The author draws attention to the fact that *Phlebotomus argentipes* is with difficulty induced to feed more than once, that it lives at most 8

days, and thus cannot be responsible for the continued infectivity of a house for months after a case of kala azar has left, and that in certain cases in spite of its presence in an infected house other cases do not occur, while it may be present in numbers in a locality free from the disease. He states that these observations " make one pause before accepting the findings of the Research Workers' Conference of Calcutta as convincing. Nay, these findings seem to negative their assumption " and " seem to prove that sand-flies are not the culprits." In an earlier paper the author states that " the place of the bed-bug is taken by the sand-fly, *P. argentipes*, which seems to be the most probable vector of kala azar." He then speculates on the possible methods of transmission by these flies, but it is evident that he should make observations on a more extensive scale before he pronounces an opinion.

C. M. W.

Report of the 2nd All-Bengal Kala-Azar Conference. Opened by H. E. Lord Lytton, the Governor of Bengal. Held at the Govt. House, Calcutta on 21st November, 1925. The Rotunda Hall, Writers' Buildings, Calcutta on 22nd, 23rd & 24th Nov., 1925. [CHATTERJEE (G. C.), Hon. Sect.]—pp. iv. + 161. With 12 figs. Published by Sect., The Central Co-opt. Antimalaria Soc. Ltd., 1-2A Premchand Boral Street, Calcutta.

The papers read at the Conference deal chiefly with the incidence of kala azar in various parts of Bengal and the efforts which have been made to treat the cases which have been brought to light. It was concluded that though the method of spread of the disease was not known it was still possible to check its spread and even eradicate it by means of the well-known antimony treatment. Quite apart from the fact that the various surveys had revealed the widespread nature of the disease, it was evident that it was on the increase and that in many places the death rate was twice as high as the birth rate. It was decided that the campaign against the disease could not be carried out effectively unless there was complete co-operation between all the various organizations whose duty it was to guard the health of the population. It was proposed to set up a " Kala Azar Intelligence Bureau " to co-ordinate the work and the information obtained. To carry out the scheme, sufficient financial assistance from the Government would be essential.

C. M. W.

TURKHUD (D. A.), KRISHNAN (K. V.) & IYER (P. V. Seetharama). **An Investigation of Kala-Azar in Certain Endemic Areas in Southern India.**—*Indian Jl. Med. Res.* 1926. Jan. Vol. 13. No. 3. pp. 703-747. With 1 map, 1 chart & 3 plans.

The authors of this report studied kala azar in various towns and villages of Ramnad and Tinnevelly in Southern India. In all, 216 cases of the disease were encountered and these were studied from the points of view of distribution, age, sex, caste, date of onset and family and house incidence. In all these respects the disease corresponded with the types well known in other parts of India. Special attention was paid to the possible occurrence of carrier cases. It was noted that apparently perfectly healthy children might have splenic enlargement, and the examination of a number of these showed that some at least had kala

azar. In various places 2,503 children were examined. Of these, 83 had enlargement of the spleen and kala azar was diagnosed in 11 of them. It was also found that 7 men, who from the history they gave had undoubtedly had kala azar, had recovered after attacks of *cancrum oris*. A careful survey of the fauna and flora associated with the disease was carried out. Most noteworthy is the fact that *Phlebotomus argentipes* was found in all the endemic areas of the Ramnad district: at Kilakarai and Panaikulam, both Mohammedan towns, every house visited was found to be infested with these flies. It may be noted that the Mohammedans supplied the majority of cases of the disease. In other places the fly was not found or was rare, but this is attributed to the season being unfavourable. At Kayalpatnam it was noted that a tick (*Ornithodorus savigny*) attacked man. Other important biting arthropods found were Culicoides, Cimex, Pulex and Ctenocephalus.

From the data obtained the authors draw certain conclusions regarding the method of spread of kala azar. Owing to the filthy conditions of the houses and the fact that dysenteric complications of kala azar so commonly occur, they see a possibility that the disease may result from oral contamination, especially as children are so commonly attacked. They state that malaria, an insect-borne disease, is most usually seen in adults and if kala azar is similarly insect-borne, the same should apply to it. On the other hand, they recognize that their observations on *Phlebotomus argentipes* conform with the view that it is the transmitter of the disease.

C. M. W.

Mudaliar (M. R. Guruswami), Raman (T. K.) & Raman Menon (K.). **Kala-Azar on the West Coast of India.**—*Indian Jl. Med. Res.* 1926. Jan. Vol. 13. No. 3. pp. 531-532. [3 refs.]

A Mohammedan, aged 25, travelled from Bombay to Madras and was immediately admitted to hospital and found to be suffering from kala azar. He had lived in Calicut till August, 1924, when he took train to Mangalore, where he remained 3 days before taking steamer to Bombay. He remained in Bombay, or Kalyani, 35 miles distant, for 14 months, during the last 5 of which he was not well. He then travelled to Madras. It is evident he contracted kala azar in Calicut, Mangalore or Bombay, but unless a very long incubation period is admitted it must have been in Bombay.

C. M. W.

Chatterjee (Anukul Chandra). **Infectiousness of Kala-Azar and its Control.**—*Indian Med. Rec.* 1926. Jan. Vol. 46. No. 1. pp. 1-14. [14 refs.]

This is a lengthy discussion of the question of infection in kala azar and the method of prevention. It is concluded that a kala azar case is not directly infectious but that it renders a locality infectious. Furthermore, during treatment by tartar emetic this property of infecting localities is lost, so that it should be possible to eradicate the disease by a well organized wholesale treatment of all cases in infected villages. A careful watch for early cases will be important in checking outbreaks at their commencement.

C. M. W.

Société des Nations. Organisation d'Hygiène. Etude épidémiologique sur la "Leishmaniose viscérale" en Espagne. [Pittaluga (G.).] [**League of Nations. Epidemiological Study of Kala Azar in Spain.**]—28 pp. With 3 text figs. 1925. Oct. 8. Genève. C.H. 368. In Spanish in *Rev. Méd. de Barcelona.* 1926. Jan. Year 3. Vol. 5. No. 25. pp. 42-62. With 1 map. [57 refs.], and in Italian in *Ann. d'Igiene.* 1926. Apr. Vol. 36. No. 4. pp. 259-284. With 1 map.

The report is a summary of knowledge regarding kala azar in Spain, between three and four hundred cases of which have been diagnosed. The distribution illustrated in a map shows that there are 3 main endemic centres. The largest is on the east coast, another is on the southern coast, and a third is in Madrid and the districts between it and Portugal. Other smaller centres occur, and it appears evident that with further observation a wider distribution will be made known. The disease corresponds in all respects with the infantile kala azar of other Mediterranean foci. In certain places dogs also have been found infected, and though the author states that Vila had sent him from Tortosa in 1914 a sick cat it is not clear that leishmania were actually found in the animal, though he refers to the well known discovery of such an infection in a cat by Sergent, Lombard and Quilichini. Much of the article is taken up with a discussion of the possible mode of transmission, and the various repeatedly discussed insects are passed under review without anything definite being asserted. Sand flies (*Phlebotomus papatasii, P. legeri, P. minutus* and *P. sergenti*) are abundant in Spain throughout the summer both in the towns and certain rural districts.

The author advocates a careful investigation of the disease in Spain and emphasizes the importance of accurate diagnosis by discovery of parasites before the institution of treatment with tartar emetic, which has given very good results.

C. M. W.

de Buen (Sadi.) Le kala-azar infantile et les autres leishmanioses en Espagne. [**Infantile Kala Azar and other Leishmanial Infections in Spain.**]—*Bull. Office Internat. d'Hyg. Publique.* 1926. Mar. Vol. 18. No. 3. pp. 268-70. [2 refs.]

Accounts of kala azar in Spain have already been published by the author (this *Bulletin*, Vol. 22, p. 697). In the present note he again states that he has himself had information of 88 cases but that in all about 300 cases have been noted in Spain. Certain details of the localities affected and the temperature conditions prevailing are given. In certain places sand flies have been seen.

C. M. W.

de Capua (Filippo). La diffusione della Leishmaniosi infantile. Osservazioni sulla casistica di un decennio. [**Diffusion of Infantile Kala Azar in Naples.**]—*Pediatria.* 1926. May 1. Vol. 34. No. 9. pp. 449-466. With 4 charts & 1 map. [6 refs.]

During the ten years 1916–1925 there have been observed at the Clinica Pediatrica of Naples 401 cases of kala azar. Though the whole of the province yielded cases the majority came from the district immediately south of Vesuvius. Children from 18 to 24 months of

age are most usually infected. With treatment 75 per cent of the cases recover. It has been found by experience that the separation of the infants from their mothers by taking them into hospital is a very dangerous procedure, which considerably diminishes the chances of recovery.

C. M. W.

JUNKIN (Charles Ivan). **Kala-Azar. A Case occurring in New York.** —*Jl. Amer. Med. Assoc.* 1926. Feb. 13. Vol. 86. No. 7. pp. 479-482. With 3 text figs. [9 refs.]

The paper gives an account of a case of kala azar in an Indian who had been in the United States 18 months. He was admitted to hospital as a result of an accident and declared that he had previously been quite well except for an attack of fever 5 years before. The accident having undoubtedly caused a rupture of the left kidney, the diagnosis was for some time obscure. The persistence of fever, together with an enlarged spleen, raised the possibility of kala azar, which was diagnosed by the discovery of *Leishmania donovani*. The interesting feature of the case is the history which, if correct, would indicate infection in Colombo. The patient was born and raised in the Calcutta district but had been employed as a dock labourer in Colombo for "several years" before going to the United States. At Colombo, at the Suez Canal and at the point of entry to the United States he passed the medical examinations. Unfortunately the paper does not state whether during his residence in Colombo he returned to Calcutta from time to time.

C. M. W.

GIRAUD (Paul) & CAUDIÈRE (Marcel). Les lésions histologiques du kala-azar infantile. **The Histological Lesions of Infantile Kala Azar.**]—*C.R. Soc. Biol.* 1926. Apr. 9. Vol. 94. No. 12. pp. 885-887. [1 ref.]

A study of fatal cases of infantile kala azar in the Marseilles district has shown that the infection in the liver, spleen, bone-marrow and glands attacks the endothelial elements, so that kala azar can be regarded as a disease of the reticulo-endothelial system, a view which explains the clinical symptoms and the pathology of the disease.

C. M. W.

DUDGEON (Leonard S.). **Case of Kala-Azar in a Child treated with Intravenous Sodium Antimony Tartrate. Death. Microscopical Examination of the Various Viscera.** *Proc. Roy. Soc. Med.* (Section of Trop. Dis. & Parasit.) 1926. May. Vol. 19. No. 7. pp. 11-13.

The author describes a fatal case of infantile kala azar which was unsuccessfully treated with tartar emetic. The illness began in Singapore when the child was 1½ years of age and exactly one year after it had been brought there from Malta, where it had lived 3 months and where it is probable infection had taken place. The child, which suffered from bronchial attacks and diarrhoea, tolerated the injections of tartar emetic badly, especially as these had to be administered under an anaesthetic. It died on September 2nd a few hours after receiving an injection of antimony, the treatment having been commenced on May

25th. A careful post-mortem examination was made and the various organs examined. Parasites were discovered in the liver, spleen, bone-marrow, haemolymph glands, duodenum and ileum.

C. M. W.

Cannata (S.) Ulteriore contributo alla terapia della Leishmaniosi infantile. **Treatment of Infantile Leishmaniasis.**—*Pediatria.* 1925. Dec. 15. Vol. 33. No. 24. pp. 1309-1311.

In the treatment of infantile kala azar in Italy, the author has found that certain cases are resistant to tartar emetic. He gives a brief account of three such cases which responded to treatment when sodium antimony tartrate was substituted and of ten cases which were effectively treated with this drug from the beginning. He points out that as the cases which were resistant to the potassium salt responded to the sodium salt the cases cannot be regarded as resistant to antimony but merely to the particular salt of antimony.

C. M. W.

Mitra (Nibaran Chandra). **Urea Stibamine in Kala-Azar. A Report on Sixteen Cases.**—*Calcutta Med. Jl.* 1925. Nov. Vol. 20. No. 5. pp. 177-183.

The paper is an account of the author's experience in the treatment of a number of cases of kala azar. He is inclined to believe that though urea stibamine gives very good results, these are improved by combining its use with that of sodium antimony tartrate. The duration of treatment is lessened if a course of urea stibamine is commenced after a few injections of antimony tartrate.

C. M. W.

Chaterjee (Anukul Chandra). **Experience in the Treatment of Kala-Azar with Urea-Stibamine.**—*Indian Med. Rec.* 1926. Feb. Vol. 46. No. 2. pp. 39-44.

The author gives an account of 18 cases of kala azar, all admitted to hospital in a critical condition, treated with urea stibamine. Some were treated at first with sodium antimony tartrate and proved resistant to the drug. Of the 18 cases 13 were cured and 5 died. It is noted that this result is not so good as those reported by others who have used urea stibamine, but nevertheless the drug has the great advantage of curing rapidly and not causing any symptoms of intolerance.

C. M. W.

Kundu (S.). **Intra-Muscular Injection of Urea Stibamine.**—*Indian Med. Gaz.* 1925. Dec. Vol. 60. No. 12. pp. 583-584.

The paper records a case of kala azar in a child aged 1½ years which was successfully treated by intramuscular injections of urea stibamine. Nine injections of ·01 to ·08 gm. in 1 to 2 cc. of distilled water were given every third day, a total of 0·65 gm. The injections caused no trouble except the last, which was given into the muscles of the thigh. There was high temperature for three days, and pain and swelling at the site of injection. The intramuscular injections were discontinued and

in a fortnight the child appeared to have been cured. To prevent relapse, four intravenous injections were given. A year has now elapsed and the child is quite healthy.

C. M. W.

Napier (L. E.). **A New Organic Antimony Compound for the Treatment of Kala-Azar.**—*Indian Med. Gaz.* 1925. Dec. Vol. 60. No. 12. pp. 571-572.

At the request of the Union Drug Company Ltd., Calcutta, the author tested on seven cases of kala azar a preparation labelled "Aminostiburea." It was a light brown powder easily soluble in water and giving a brown coloured solution. It was said to be a combination of para-amino-phenyl-stibinic acid with urea and glucose and to contain 24·8 per cent metallic antimony. The results indicate that as regards its therapeutic efficiency the drug is in the same class as stibosan and urea stibamine.

C. M. W.

Brahmachari (Upendra Nath) & Das (Judhisthir). **Chemotherapy of Antimonial Compounds in Kala-Azar Infection. Part XVIII. Further Observations on certain Derivatives of P-Amino-Phenyl Stibinic Acid Continued.**—*Indian Jl. Med. Res.* 1926. Jan. Vol. 13. No. 3. pp. 693-694.

A series of chemical notes relating to: (1) Stib-glycine-amide; (2) glucose compounds with p-amino-phenyl stibinic acid and its derivatives; (3) condensation of dichloro-acetamide with p-amino-phenyl stibinic acid; (4) sodium salt obtained by replacement of NH_4 from urea stibamine by Na. The compound is named sodium-carbamino-p-stibanilate. It is noted that the glucose compounds mentioned are weaker (? therapeutically) than the antimony compounds from which they are derived.

C. M. W.

Young (Charles W.) & Hertig (Marshall). **Attempts to transmit Kala Azar by Means of Rodent Lice, *Haematopinus* sp.** *Proc. Soc. Experim. Biol. & Med.* 1926. Feb. Vol. 23. No. 5. pp. 398-402. [3 refs.]

The fact that hamsters kept in captivity become heavily infested with lice (*Haematopinus* sp.) led the authors to test the possibility of transmission of *Leishmania donovani* by these insects. It is known that parasites occur in the peripheral blood of patients in China, while smears of the heart blood made at autopsy from heavily infected hamsters are usually positive. Furthermore, sandflies (*Phlebotomus* sp.) fed on both striped and giant hamsters may develop flagellates in their intestines. It is thus evident that parasites occur at least at times in the peripheral blood of these animals. Though smears of lice from 153 striped hamsters and 329 giant hamsters known to be infected were examined, in no case were leishmania found. Crushed lice were then injected into a number of striped and giant hamsters and in three instances the striped hamsters became infected. Attempts were made to effect transmission from hamster to hamster by keeping pairs of infected and uninfected hamsters in the same cage but separated of necessity by a wire screen, owing to their cannibalistic habits. Fifteen

pairs of striped hamsters and ten pairs of giant hamsters were kept in this way for periods varying from 22 to 357 days. Though there was every possibility of the lice passing from one animal to another, in no case did infection result. In addition, two striped hamsters and one giant hamster kept separately had lice transferred to them from infected animals. During the observations of 229 to 271 days no infection occurred. It is thus evident that though *L. donovani* may survive for a short period in lice, no development takes place.

C. M. W.

Young (Charles W.) & Hertig (Marshall). **Attempts to transmit Kala Azar by Means of Bedbugs (*Cimex* sp.).**—*Proc. Soc. Experim. Biol. & Med.* 1926. Feb. Vol. 23. No. 5. pp. 402-405. [5 refs.]

Experiments similarly conducted to those described above were carried out with striped hamsters and the bed bug, *Cimex lectularius*, and the bat bug, *Cimex pipistrelli*. The bugs thrive in the pots in which the hamster cages are kept. Eleven experiments were made with the bed bug and ten with the bat bug, and though the observations extended from 112 to 286 days, no infection occurred. It is noted that in China kala azar cases are solitary, there being only one infected person per household. Adults and children frequently sleep crowded together, the patient among them, and as bed bugs are plentiful a succession of cases would inevitably occur if this insect were the vector.

C. M. W.

Young (Charles W.) & Hertig (Marshall). **A Search for Field and House Rodents Naturally Infected with Kala-Azar.**—*Proc. Soc. Experim. Biol. & Med.* 1926. Feb. Vol. 23. No. 5. pp. 395-398. [2 refs.]

The extreme susceptibility of the striped hamster to inoculation with *L. donovani* suggested the possibility of this animal acting as a reservoir for the parasite. Large numbers (4,480) of these animals were examined, and in one a very heavy natural infection was discovered. Its organs were used for the inoculation of 11 other hamsters, 8 of which became infected. 400 giant hamsters and 134 voles were examined with negative results. Of house rodents, 400 rats and 114 mice from clean houses and 210 rats and 57 mice from kala azar houses were not infected. Thus of 5,819 rodents examined, only one was infected. It should be noted that the one infected hamster was kept in the same building as infected hamsters, but in a separate room, and that it was killed 6–8 weeks after being brought from the field. Nevertheless, the authors do not doubt it was an instance of natural infection. As it came from a locality where 5 per cent of the inhabitants are infected, it does not appear probable that these rodents are the source of human kala azar.

C. M. W.

Young (Charles W.) & Pao-Yung Liu. **Susceptibility of Field, House and Laboratory Rodents to Infection with *Leishmania donovani*.**—*Proc. Soc. Experim. Biol. & Med.* 1926. Feb. Vol. 23. No. 5. pp. 392-395. [3 refs.]

As a result of the discovery that the striped hamster (*Cricetulus griseus*) was very susceptible to inoculation with *L. donovani* in N.

China, it became desirable to test the susceptibility of other animals. It was found that the giant hamster (*Cricetulus triton*), a vole (*Microtus* sp.) and the Chinese house mouse (*Mus wagneri*) are markedly susceptible and showed no tendency to spontaneous recovery, whereas the house rat (*Mus rattus*), white rat (*Mus norvegicus albinus*) and the white mouse (*Mus musculus albinus*) showed infections of only moderate intensity and seemed to exhibit a tendency to recover spontaneously.

C. M. W.

Young (Charles W.), Smyly (H. Jocelyn) & Brown (Cabot). **Experimental Kala Azar in a Hamster,** *Cricetulus griseus* **M. Edw.**—*Amer. Jl. Hyg.* 1926. Mar. Vol. 6. No. 2. pp. 254-275. With 7 figs. on 2 plates. [18 refs.]

This paper is an amplification of those already reviewed (this *Bulletin*, Vol. 21, p. 720) and deals with the susceptibility of the striped hamster to inoculations with *Leishmania donovani*. It is shown that in this animal there is no tendency to spontaneous recovery as there is in the case of the white rat. Infection is most easily effected by intraperitoneal inoculation which leads to a general infection as also one of the peritoneal cavity in which parasites may persist for at least 11½ months. Intrapleural inoculation also leads to a general infection, but in this case no infection of the peritoneal cavity occurs. Subcutaneous inoculation is successful in a smaller proportion of cases, but feeding has given only negative results. After an interval of about one month, liver puncture is a safe criterion of systemic infection, but 5 to 10 per cent of light infections may be missed.

C. M. W.

Kligler (I. J.). **The Cultural and Serological Relationship of *Leishmania*.—*Trans. Roy. Soc. Trop. Med. & Hyg.*** 1925. Nov. 19 & Dec. 17. Vol. 19. Nos. 5 & 6. pp. 330-335. [4 refs.]

In an earlier paper (this *Bulletin*, Vol. 21, p. 726) the author described a method of cultivating leishmania in a medium which differed from that used by Noguchi for the cultivation of leptospira only in the addition of whole blood of the rabbit in place of serum. In the present paper the author gives an account of serological investigations carried out with various strains of leishmania. His results agree with those obtained by Noguchi (this *Bulletin*, Vol. 22, p. 692).

The author maintained cultures on a 0·2 per cent. nutrient agar medium containing 0·1 per cent. dextrose and 10 per cent. fresh rabbit serum. The stock semi-solid agar is prepared by adding one part of standard dextrose agar to nine parts of normal saline solution. The tubes, each containing 4·5 cc., are autoclaved. When required, the semi-solid agar is melted and 0·5 cc. of fresh rabbit serum added to each tube. The medium is transparent and straw coloured, and growth occurs in the upper portion of the medium as abundantly as aerobic bacteria. After seven to ten days there is a heavy greyish mass about 3 to 5 mm. in thickness and swarming with flagellates. For the study of fermentation reactions the medium is made with plain agar without dextrose and 0·5 per cent. of the desired carbohydrate added. The occurrence of fermentation was determined by testing the pH of the medium. As the acidity rarely rises above pH 6·0 neutral red proved to be a satisfactory indicator.

Immune sera were prepared by inoculating rabbits intravenously at three- to five-day intervals with doses of 0·5 to 2·0 cc. of heavy surface growth. Serum drawn from animals seven to ten days after a fifth injection were potent in dilutions of 1-40th to 1-100th.

For carrying out agglutination tests, the most satisfactory results were obtained with cultures on ordinary 1·5 per cent. nutrient agar slants to which 0·1 per cent. dextrose and 10 to 15 per cent. clear rabbit serum were added. A heavy suspension of young flagellates was inoculated into the water of condensation, after which the tubes were slanted so that the whole surface of the agar was covered. In seven to ten days a good greyish-white growth covers the slant. The growth is washed off with saline solution and the emulsion shaken vigorously in a flask with beads to break up clumps. The emulsion is placed in tubes and allowed to stand till the heavier particles have settled. The supernatant fluid is then used for the agglutination test. If the suspension is made in buffered solution of pH 7·0 it stands up much better than in ordinary saline.

To the suspension serum is added in various concentrations. In a dilution of 1-5th the flagellates are immobilized in two or three hours and agglutination can be observed under the microscope. Macroscopic agglutination is visible in twenty-four hours. A second method is to draw the flagellates from the surface of a seven-day-old growth in the semi-solid medium described above. It is emulsified and shaken with an equal volume of saline solution. To 1 cc. or 0·5 cc. of the emulsion in a Wassermann tube is added an equal volume of the dilute serum and mixture is effected by rotation. At 25° C. distinct agglutination is observed in forty-eight hours in the higher concentrations of serum (1-5th and 1-10th).

Not only does the serum agglutinate the flagellates but in the higher concentrations it exerts a definite lytic action producing degeneration of the flagellum and then the nucleus.

As a result of these experiments, it was found that the organisms causing distinct pathological conditions were serologically distinct. *Leishmania tropica* (strains from Aleppo, Bagdad and Palestine and a fourth strain of unknown origin) was serologically distinct from *Leishmania infantum* and *Leishmania brasiliensis*, which again were serologically distinguishable from one another. As regards the fermentation tests, it was found that all the strains of *Leishmania tropica* gave uniform results. Dextrose and saccharose were fermented with ease: maltose and lactose less readily. Mannite was not fermented. *Leishmania brasiliensis* fermented only dextrose, and *Leishmania infantum* dextrose nd saccharose. Owing to lack of other strains of the last named forms, it was not possible to test the constancy of these reactions.

C. M. W.

Giuffré (M.). La reazione meiostagminica di Ascoli nella leishmaniosi interna. [**The Meiostagmin Reaction in Kala Azar.**]—*Pediatria.* 1926. Apr. 1. Vol. 34. No. 7. pp. 337-349. [32 refs.]

The author has tested the meiostagminic reaction of Ascoli in cases of infantile kala azar. The reaction is a reduction in surface tension of a mixture of serum containing antibody and antigen which becomes evident after incubation at 37° C. to 50° C. The surface tension is tested with a stalagmometer, an instrument for registering the rate of drops, which is highest in liquids of low tension. In the case of kala

azar antigens were prepared from cultures of *Leishmania donovani* and *Leishmania tropica* and the spleen removed post mortem. With the first antigen thirteen tests gave a positive reaction in five, with the second four tests gave a positive reaction in one, and with the third antigen five tests gave a positive reaction in two.

C. M. W.

Meleney (Henry Edmund). Ueber Wucherung des Lungengefässepitheliums bei mit Kala-azar infizierten Affen. [**Proliferation of Epithelium of Lung Vessels in Monkeys infected with Kala Azar.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1925. Dec. 16. Vol. 29. No. 12. pp. 685-689. With 2 text figs. [4 refs.]

The object of the paper is to draw attention to the fact that in monkeys experimentally infected with *Leishmania donovani* the endothelial cells of the capillaries and veins of the lung may show marked hypertrophy, giving rise to nodules composed of large endothelial cells filled with parasites, as is commonly noted in the liver, spleen and other organs.

C. M. W.

Funaioli (Giulio). La leismaniosi canina in Tripolitania. [**Canine Leishmaniasis in Tripolitania.**]—*Arch. Ital. Sci. Med. Colon.* Tripoli. 1925. Jan.-Feb.-Mar. Vol. 6. No. 1-2-3. pp. 12-14. [6 refs.]

An examination of 177 dogs in Tripoli during 1922 and 1923 for evidence of leishmania infection led to the discovery of two cases of canine kala azar, one in August, 1922, and the other in November of the same year.

C. M. W.

Césari (E.). La leishmaniose canine. [**Canine Leishmaniasis.**]—*Rev. Générale Méd. Vét.* 1925. No. 15. Vol. 34. No. 407. pp. 613–632. [10 refs.]

The article gives a general account of canine kala azar, the author evidently having been stimulated to write it as a result of his recent discovery of the disease in dogs at Grasse in the South of France (*ante*, p. 104). There is no new information, the article having been based on papers which have been reviewed in this *Bulletin* from time to time.

C. M. W.

Sergent (Et.), Catanei (A.), Gueidon (E.), Bouguet (A.) & des Isles (H. Merle). Le clou de Mila. [**Clou de Mila.**]—*Arch. Inst. Pasteur d'Algérie.* 1925. Mar. Vol. 3. No. 1. pp. 1-8. With 12 figs. [2 refs.]

The existence of oriental sore at Mila in Algeria has been already noted (this *Bulletin*, Vol. 21, p. 725). The present paper gives a more detailed account of the investigations in this district. Ten cases of the disease are noted and leishmania were found in ulcers in the ear and nose of a dog. Examination of the bone marrow did not reveal any parasites. Sand flies are plentiful in the district, the commonest

species being *Phlebotomus perniciosus*. Other species are *P. papatasii*, *P. minutus* and *P. sergenti*. The paper is well illustrated with photographs of the human and canine cases and views of Mila.

C. M. W.

Agronik (M. A.) Zwei Fälle von Hautleishmaniosis. [**Two Cases of Dermal Leishmaniasis.**]—*Dermat. Woch.* 1925. Nov. 14. Vol. 81. No. 46. pp. 1665-1673. With 2 text figs. [29 refs.]

A description of two cases of oriental sore in men who had returned to Moscow from South East Russia. In one case the incubation period was at least a year, while in the other two sores developed at the site of a skin wound.

C. M. W.

Agronick (M. A.). **On the Propagation, Pathogenesis and Treatment of the Oriental Sore.**—*Russian Jl. Trop. Med.* Moscow. 1925. No. 1-2-3. English summary p. 74. [In Russian pp. 65-68. 41 refs.]

The author draws attention to cases of oriental sore in Moscow in people returning from the Transcaspian districts. He mentions an outbreak which occurred at Serax on the frontiers of Persia where in the course of one month 150 soldiers of the Red Army had to be invalided because of the disease. During last year he saw 14 such cases in Moscow.

C. M. W.

Sergent (Edmond) & Parrot (L.). *Phlebotomus papatasii* **and Oriental Sore.** [Correspondence.]—*Indian Jl. Med. Res.* 1926. Jan. Vol. 13. No. 3. pp. 749-750.

The writers state that in their experiments with sand flies and oriental sore, in which by inoculating crushed-up female sand flies into the skin of a human being oriental sore was produced (this *Bulletin*, Vol. 19, p. 315), the actual flies crushed were assumed to be *P. papatasii* as they were large and easily distinguished from *P. minutus*. The assumption that they were not *P. sergenti*, which closely resembles *P. papatasii*, is justified, for of several hundred male flies collected in the same locality at the same time none was found to be *P. sergenti*. A later examination confirmed this, for *P. sergenti* was not found in Biskra.

C. M. W.

Nicolle (Charles). Quelques considérations sur la leishmaniose tégumentaire américaine. [**Reflections on American Dermal Leishmaniasis.**]—*C. R. Soc. Biol.* 1926. Feb. 26. Vol. 94. No. 7. pp. 476-477.

During a stay of three weeks in the provinces of Salta and Jujuy in the Argentine the author had an opportunity of observing 20 cases of cutaneous leishmaniasis. The well known differences between the skin

disease of S. America and that of the eastern hemisphere, viz., the long duration, severity and tendency to invade the mucosae in the case of the former, were evident, but in addition another peculiar feature was noted. The American disease showed a marked predilection to involve the margins of the nostrils and the upper lip. The author believes that this is an indication that the disease is not spread by sand flies or mosquitoes, which do not select these points on account of the inconvenience caused them by the air currents due to breathing. He thinks it more probable that direct inoculation takes place from man to man by one of the heavier biting arthropods or by direct contact. The long duration of the disease is in favour of this method of transmission.

Cultures obtained of the organism showed that it differed in no way from other forms of leishmania.

C. M. W.

MONTENEGRO (João). **Cutaneous Reaction in Leishmaniasis.**—*Arch. Dermat. & Syph.* 1926. Feb. Vol. 13. No. 2. pp. 187-194. With 3 text figs. [3 refs.]

A cutaneous reaction having been demonstrated by WAGENER (this *Bulletin*, Vol. 22, p. 202) in rabbits rendered immune by injections of culture, the author tested the reaction in cases of leishmaniasis in Brazil. The extract was prepared as described by WAGENER except that the flagellates from the cultures were washed three times in saline solution to remove completely all haemoglobin. Furthermore, it was found that the addition of toluol caused a reaction to appear so that it was omitted. Extracts were made from cultures of Brazilian leishmania (*L. brasiliensis*) and those of oriental sore (*L. tropica*). Injections were made intradermally with a fine syringe. In positive cases, after 24 hours, there appeared a rounded area with a diameter two or three times that of the original papule formed by the inoculation. The area is red, congested, and has a consistency greater than that of the surrounding skin, and is easily palpable. In some cases the centre of the papule remains pale and clearly defined: at other times all one sees is punctiform haemorrhage in the centre at the point of entry of the needle. The reaction varies in different cases. In some, vesicles are formed. The reaction lasts several days and disappears slowly. The test was applied to 37 cases and a positive reaction was obtained in 32. Of 36 cases free from leishmania infection 33 gave no reaction, while 3 gave less intense reaction which, however, differed from the specific leishmania reaction. The extract of *Leishmania tropica* produced a reaction in a Brazilian case, an indication that the two species are identical.

C. M. W.

DE REZENDE (Mario Ottoni). Cura da leishmaniose das mucosas. [**Cure of Mucosal Leishmaniasis.**] *Ann. Paulist. Med. e Cirurg.* 1925. Nov. Year. 13. Vol. 16. No. 11. pp. 135-142.

In May, 1923, the author brought to the notice of the Medical Society of S. Paulo a method of treatment of leishmaniasis of mucous membranes by means of lactic acid applied locally. He here records

twenty more cases in which the results appear to have been excellent and rapidly achieved. The disease affected usually the nose and had existed for periods up to 13 years. Curettage was performed and thereafter weekly applications of 80 per cent. lactic acid were made and usually in one to three months complete cure was effected. In many of them the usual forms of treatment, as by "606" and by antimony injections had been tried in vain.

Intravenous injection of 1–2 per cent. lactic acid (wrongly stated as 20 per cent. in one record) in doses of 2 cc. on alternate days was also employed, but was not so satisfactory and produced toxic symptoms.

H. Harold Scott.

Pupo (J. de Aguiar). Tratamento da leishmaniose da mucosa pelo "Eparseno" (Amino-arseno-phenol, de Pomaret). (Estudo preliminar.) **Treatment of Mucosal Leishmaniasis by Eparseno.**]—*Brazil-Medico.* 1926. Apr. 10. Year 40. Vol. 1. No. 15. pp. 201-204; also in *Sciencia Medica.* 1926. May 31. Vol. 4. No. 5. In Portuguese pp. 207–211. In French pp. 212–216.

The author reports three cases of S. American cutaneous and mucosal leishmaniasis in which he has obtained excellent results by treatment with intramuscular injections of eparseno (dioxy-diamido-arsenobenzol) as prepared by Poulenc Frères, Paris. Injections of 12½ to 25 centigrams (1 to 2 cc.) can be given, and though there is some local pain no untoward results follow. As many as 10 to 20 injections can be given in series at intervals of 2 to 3 days.

C. M. W.

Sinderson (H. C.). **Emetine Hydrochloride in the Treatment of Oriental Sore. Notes on a Further Series of Cases.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1925. Oct. 15. Vol. 19. No. 4. pp. 232-234. [1 ref.]

In an earlier paper (this *Bulletin,* Vol. 22, p. 206) the author describes the good results following treatment of oriental sore with a 5 per cent. solution of emetine. He now gives an account of the treatment of another series of cases in which 22 patients with a total of 83 sores were treated with a 2 per cent. solution in place of the 5 per cent. solution previously used. In only one case, a solitary sore at the root of the nose, have the results been other than uniformly satisfactory. The essential point in injection is to reach every part of the sore and in the large ulcerating forms it may be necessary to puncture in three or four places. Following injection, the puncture site is sealed with a little cotton wool and collodion flexile to prevent escape of fluid. The sores are dressed daily with a simple dry-gauze, the edges of which are painted with collodion flexile. When ulceration is very deep, healing may not be complete for a month, but in small unbroken sores the process is usually complete within a fortnight. The uniformly successful results not only indicate the great value of emetine hydrochloride in the treatment of oriental sore, but they give the drug strong claims to being considered a specific remedy for this disease.

C. M. W.

i. Raynaud (Lucien). **Leishmaniasis in North Africa.**—*Monthly Epidemiol. Rep. of the Health Sect. of the Secretariat.* League of Nations. 1925. Dec. 15. Vol. 4. No. 12. pp. 609-615. With 1 text fig. [86 refs.]

ii. Gérard (F.); Salvo; Cortesi. Nouvelles observations de kala azar en Tunisie. [**Fresh Kala Azar Cases in Tunis.**]—*Arch. Inst. Pasteur de Tunis.* 1925. Dec. Vol. 14. No. 4. pp. 462-464.

iii. Barbacci (P.). Sur un cas de *Leishmania infantum* observé à Sienne (Italie). Remarques épidémiologiques. **A Case of Infantile Kala Azar seen at Sienna.**]—*Bull. Soc. Path. Exot.* 1926. Jan. 13. Vol. 19. No. 1. pp. 11-14. With 1 text fig.

iv. Bouchè (B. J.). **A Case of Kala-Azar in the Simla Hills.** *Indian Med. Gaz.* 1926. Jan. Vol. 61. No. 1. pp. 20-21.

v. Mühlens (P.). Ein mit Antimosan geheilter Fall von indischem Kala-azar. [**A Case of Indian Kala Azar cured by Antimosan.**] —*Arch. f. Schiffs- u. Trop.-Hyg.* 1926. Apr. 1. Vol. 30. No. 4 pp. 160-166. With 7 text figs. [1 ref.]

vi. Kasuga (Kenzo) & Tamura (Ichiro). **Cultivations of *Leishmania donovani* and some Experiments on the Immunization.**]—*Gun-I-Dan Zasshi* (*Jl. Japan Milit. Med. Assoc.*). 1925. Mar. No. 141. [Summarized in *Japan Med. World.* 1925. Oct. 15. Vol. 5. No. 10. p. 295.]

i. The article gives no new information and erroneously attributes to McCombie Young the experiments conducted with sand flies in Assam.

ii. A note on the 71st, 72nd and 73rd cases of infantile kala azar in Tunis.

iii. A note on two cases of infantile kala azar observed at Sienna in Italy. It is possible that in both cases the disease was contracted in Monaco.

iv. A case of kala azar diagnosed in the Simla Hills in a patient 12 years of age who had been sent there from Sanawar with a statement to the effect that she was suffering from anaemia, the result of chronic malaria.

v. An account of an acute case of kala azar in an Indian sailor which was cured by 4·8 grams of antimosan given in 22 injections during a course of 10 weeks.

vi. The medium employed was a dextrose agar and rabbits' blood. The blood of rabbits which had been infected with the cultures contained agglutinins and gave some indication of a complement fixation reaction.

C. M. W.

i. Dubreuilh (William). Les leishmanioses tégumentaires. [**Dermal Leishmaniasis.**]—*Jl. Méd. de Bordeaux.* 1926. Jan. 25. Vol. 103. No. 2. pp. 53-58. [13 refs.]

ii. Céard (L.). Le bouton d'Orient à Colomb-Bechar (Sud Oranais). [**Oriental Sore in Sud Oranais.**] *Arch. Inst. Pasteur d'Algérie.* 1925. June. Vol. 3. No. 2. pp. 176-181. With 2 text figs. [6 refs.]

iii. Timpano (P.) Il 1° caso di leishmaniosi esterna curata col radio. [**The First Case of External Leishmaniasis cured by Radium.**] *Policlinico.* Sez. Prat. 1926. Feb. 22. Vol. 33. No. 8. pp. 260–262. With 4 text figs.

iv. Linhtrop (G. T.) & Hudalov (D. ...). **Some Autochthonous Cases of Cutaneous Leishmaniasis in Baku.** —*Russian Jl. Trop. Med.* Moscow. 1925. No. 1-2-3. English summary p. 72. [In Russian pp. 33-35.]

v. Jeanselme & Burnier. Un cas de bouton d'Orient. [**Case of Oriental Sore.**]—*Bull. Soc. française Dermat. et Syph.* 1925. Nov. No. 8. p. 426. With 1 fig.

vi. Franchini (Giuseppe). Su di un caso interessante di Buba Brasiliana. [**An Interesting Case of Brazilian Buba.**]—*Policlinico.* Sez. Med. 1926. Jan. 1. Vol. 33. No. 1 pp. 27-34. With 4 text figs.

vii. Causey (David). **Mitochondria in** *Leishmania brasiliensis* **Vianna, 1911.**—*Univ. California Public. Zool.* 1925. Nov. 21. Vol. 28. No. 2. pp. 19-28. With 21 figs. on 1 plate. [18 refs.]

i. This paper is merely a general account of leishmaniasis of the skin.

ii. The existence of oriental sore in this locality has already been noted by the author (this *Bulletin*, Vol. 22, p. 698). In the present paper four cases are recorded.

iii. The paper describes a case of oriental sore in Calabria, Italy, with a lesion on the lower lip which was cured by radium treatment.

iv. A note on 3 cases of oriental sore in Baku.

v. A case of oriental sore in a child from Persia which was rapidly cured by local injections of emetine.

vi. A description of a typical case of naso-pharyngeal leishmaniasis in a man who had returned to Italy from Brazil. One month's treatment with injections of tartar emetic brought about a remarkable improvement in the patient's condition.

vii. Examining cultural forms of *Leishmania brasiliensis* by appropriate staining methods, the author finds that mitochondria, 8 in number, occur in the cytoplasm of each flagellate. In the non-dividing forms they are spherical, but become rod-shaped when division commences. There is a similarity between the staining reactions of the parabasal body and the mitochondria, an indication that the parabasal is a derivative of mitochondria.

C. M. W.

RELAPSING FEVER AND OTHER SPIROCHAETOSES.

Sharp (N. A. Dyce). **Epidemic Disease in West Africa. The Menace of the Future. Relapsing Fever.** —*Trans. Roy. Soc. Trop. Med. & Hyg.* 1925. Oct. 15. Vol. 19. No. 4. pp. 256-264. With 3 figs. & 1 map in text.

The author discusses the recent introduction of louse-borne relapsing fever into West Africa by the Senegalese troops returning there after the war in 1920, who were the direct cause of the epidemic in 1921 in the French Sudan. The serious consequences of the introduction of this disease, which on a virgin soil has a mortality rate of between 18 and 30 per cent. or more, leads the author to conjecture that advancing civilization is likely to introduce other diseases, such as typhus, enteric, Malta fever and infections hitherto unknown in epidemic form in W. Africa. As regards relapsing fever the Zabermawa peoples who act as carriers have been chiefly responsible for its spread into Nigeria, where, in a single province having a population of two millions and a relapsing fever incidence of at least 2½ per cent., it would be impossible for even 10 medical men to cope with an epidemic. The author's outlook, if a pessimistic one, has unfortunately good reason to support it, and though he thinks that "relapsing fever will join the society of the poor in being always with us in W. Africa" it is worth while to expend the utmost energies in efforts to limit the spread of its twin brother typhus, of which a half-dozen cases have been already reported.

C. M. Wenyon.

Nogue. L'épidémie de fièvre récurrente en Afrique occidentale française (1921-1924). **The Epidemic of Relapsing Fever in French West Africa.** —*Ann. de Méd. et de Pharm. Colon.* 1925. Sept.-Oct.-Nov.-Dec. Vol. 23. No. 3. pp. 445-466. [19 refs.]

The epidemic of relapsing fever which commenced in French West Africa in 1921 appeared to have completed its evolution by the end of 1924, and the author gives in this paper a general account of the outbreak. The view that the disease was introduced by troops returning from Syria and North Africa has many facts against it. The disease was not reported from Syria amongst the troops who were returning to their own countries. Furthermore, the disease did not appear amongst the troops till after their arrival at Kouroussa over 40 days after they left Marseilles and over 2 months after they had left Tunis and the Levant. The troops had been on board ship or in Marseilles, Dakar, Conakry and Kindia, where vermin throve and there was every opportunity of the disease becoming manifest. It seems more probable that it already existed in West Africa and broke out amongst the troops who were in a condition to receive and propagate it on their arrival. In fact, outbreaks of relapsing fever had already been reported, the last at Ouakim only a few months before the troops returned to Kouroussa, where the infection appeared to commence. During the beginning of 1921 it extended from West to East and invaded the valley of the middle Niger, whence it extended along all the windings of the river. It spread north and sent out extensions towards Senegal, the Gold Coast and Nigeria. At the time of writing the districts of Chad and the Upper Cameroon are involved. As regards the spirochaete

it was said to differ from *T. duttoni* of the Congo in being more polymorphic. It was unquestionably carried by lice and not by the tick, which careful search has failed to reveal in this part of Africa. The symptoms have been often described, but all observers agree as to the suddenness of the onset, which often resembles malaria, associated with rachalgia, cephalgia, general prostration and hyperthermia. Relapse is general unless treatment has been carried out. Jaundice is a common sign and occurred in half the cases in the Sudan and in all those in Haute-Volta. Its moment of appearance varies. Sometimes it is noted on the 2nd day, at other times on the 3rd or even later, It may disappear as the temperature falls, to recur again at the relapse. Enlargement of the liver and spleen with increased sensibility is a constant sign. Albuminuria is nearly constant, the albumin in one case reaching 10 gm. per litre. More unusual symptoms are bilious diarrhoea, acute delirium, epistaxis, sometimes repeated and leading to subacute anaemia, and other haemorrhages which at Diré were said to be the cause of one half the deaths. As complications were noted suppurative otitis media, sciatica, nephritis and pneumonia. In certain cases, particularly those with jaundice, rapid emaciation occurred.

In the Sudan between May 1921 and March 1922 there were noted by the health authorities 108,696 cases with deaths as follows :

	Recognized cases.	Deaths.
Bandiangara centre	4,969	1,250
Koutiala ,, ...	1,795	861
Mopti ,, ...	100,000 (?)	16,270
Niafunké ,, ...	1,149	699
San ,, ...	698	201
Ségou dispensary	85	14

In Haute-Volta 2,474 cases with 1,048 deaths were reported from December 1921 to July 1923.

Under the heading diagnosis various diseases are described, such as malaria, bilious pneumonia, Weil's disease, yellow fever and other spirochaetal infections associated with jaundice. The various efforts at prevention and the measures adopted are explained, but it is pointed out that the study of the spread of the epidemic shows how futile such measures are when they are not assisted by the voluntary and active help of the threatened population. It indicates the necessity of ceaseless education of the native in hygienic matters.

C. M. W.

DE BUEN (Sadi). Note préliminaire sur l'épidémiologie d'une fièvre récurrente à Tiques, en Espagne. [**The Epidemiology of Tick-transmitted Relapsing Fever in Spain.**]—*Bull. Acad. Méd.* 1926. Mar. 16. 3rd Ser. Year 90. Vol. 95. No. 11. pp. 294-295.

——. Note préliminaire sur l'épidémiologie de la fièvre récurrente espagnole.—*Ann. Parasit. Humaine et Comparée.* 1926. Apr. 1. Vol. 4. No. 2. pp. 185-192.

The author has demonstrated that relapsing fever in Spain is transmitted by a tick, a near ally of *Ornithodorus morocanus*, which lives in association with pigs. The tick was found in all the districts in which relapsing fever occurred, and though lice were sometimes present they could not be responsible for the disease, which attacked chiefly the men who worked away from home. Examination of lice and their

inoculation to animals did not produce infection, whereas similar experiments made with ticks were positive. It was suggested that pigs might act as a reservoir for the human virus, but though it was shown that these animals could be infected by inoculation of crushed ticks no evidence was obtained that the pigs were ever naturally infected. In a footnote the author states that BRUMPT has been able to infect animals in Paris with ticks sent from Spain.

C. M. W.

STONES (R. Y.). **A Case of Spirillum Fever with Meningeal Symptoms.** —*Kenya Med. Jl.* 1926. Apr. Vol. 3. No. 1. pp. 27-29.

A record of 2 cases in children aged 10 years who came to hospital on succeeding days from the Mengo High School, both showing meningeal symptoms suggestive of cerebrospinal fever. In one case lumbar puncture yielded a cloudy fluid in which intracellular diplococci were found, while in the other the fluid though contaminated with blood was otherwise clear. The first case died on the 2nd day after admission while the 2nd case had relapses on the 7th and 18th days. At the first relapse the blood picture suggested relapsing fever and a prolonged blood examination revealed one doubtful spirochaete, no organisms having been seen in the blood on admission. At the 2nd relapse spirochaetes were definitely present. No other cases occurred in the school.

C. M. W.

ILLERT (E.). Beitrag zur Kultivierung der Rückfallfieberspirochäte (*Spirochaeta duttoni*). [**The Cultivation of** *S. duttoni*.]—*Deut. Med. Woch.* 1925. Dec. 4. Vol. 51. No. 49. p. 2033. [1 ref.]

Having noted that in his cultures of the relapsing fever spirochaete on a medium consisting of dilute rabbit serum (4 parts of serum to 1 part of physiological saline) to which pieces of the white of a hard-boiled egg had been added, the spirochaetes were most numerous between the pieces of egg, an attempt was made to increase the quantity of this substance. The result was not satisfactory. Partially solidified rabbit serum was made by heating the tubes in a water bath for an hour at 73° to 74° C. When seen by dark ground illumination such a medium should show numerous granular flakes between which are spaces filled with fluid. Not every rabbit will yield a serum which will give this result. In this medium a good diffuse growth is obtained at 30° C., while satisfactory subcultures can be made every two or three weeks.

C. M. W.

IWASCHENOFF (G.). N-Paratyphobazillose und Febris recurrens. **N-Paratyphoid Infection and Relapsing Fever.**—*Arch. f. Schiffs- u. Trop.-Hyg.* 1926. Jan. 8. Vol. 30. No. 1. pp. 1-17. With 1 chart in text. [18 refs.]

During epidemics of relapsing fever in Russia it was noted that many of the cases differed clinically from the usual type. There was not the same interval between the attacks, the temperature returning to normal for only a short time. The spleen and liver showed progressive enlargement, jaundice appeared and various nervous symptoms became evident. Diarrhoea, often simulating haemorrhagic colitis or cholera, followed on an initial constipation. The urine was little altered though

sometimes traces of albumin and a few red blood corpuscles were noted. The mortality rate amongst these cases was high, sometimes reaching 63 per cent. It was discovered that the disease was due to a double infection with the spirochaete of relapsing fever and a bacillus which in some cases resembled *B. paratyphosus* B. and in others the bacillus of Danysz. The bacilli were isolated not only from the blood but also from the urine, bile, faeces, pus and various organs at post mortem. It appeared evident that the unusual symptoms were due to a septicaemia caused by one or other of these organisms. With cessation of the relapsing fever epidemic the bacillary disease disappeared, so that it seems evident that the two infections are very closely interrelated.

C. M. W.

Imai (Minoru). Ein Beitrag zur Kenntnis der pathologischen Anatomie der Febris recurrens. Insbesondere ueber die "Orchitis recurrentica." [**The Morbid Anatomy of Relapsing Fever. Orchitis recurrentica.**]—*Jl. Oriental Med.* 1925. Nov. Vol. 4. No. 1. German summary p. 5. [In Japanese.]

In a case of relapsing fever with death from pneumonia it was noted that small miliary haemorrhages occurred in the subcapsular surface of the testis. On section each haemorrhagic area was found to consist of a central core of cells surrounded by a haemorrhagic zone. Between the central core and the blood were numerous large macrophages which included not only erythrocytes and nuclear remnants but also spirochaetes. The condition has been named " Orchitis recurrentica " by the author.

C. M. W.

Bykowa (Olga). Ueber die Veränderung einiger blutbildender Organe bei Typhus recurrens. [**Changes in Blood-forming Organs in Relapsing Fever.**]—*Virchows Arch. f. path. Anat. u. Physiol.* 1926. Mar. 30. Vol. 260. No. 1. pp. 169-175. With 4 text figs. [10 refs.]

In a detailed study of the changes which take place in the bone marrow, spleen, lymphatic glands and suprarenals in relapsing fever it was found that the hyperaemia and blood extravasation brought about changes which were both regressive and progressive. The regressive changes are seen either in single cells which show nuclear degeneration or complete necrosis, or in groups of cells which produce necrotic patches that may or may not cause reaction in the surrounding tissues. The necrotic areas are very evident in the spleen. The progressive changes are seen in the development of myeloid tissues, especially in the bone marrow, leading to multiplication of the mother cells (*Haemocytoblasts*), which in their turn give rise by division to granulocytes and haemoglobin-containing cells.

C. M. W.

Kartacheff (E. V.). Observations sur les globules blancs du sang dans la fièvre récurrente. [**The Leucocytes in Relapsing Fever.**]—*Ann. Inst. Pasteur.* 1925. Dec. Vol. 39. No. 12. pp. 969-982. With 4 text figs.

An examination of the blood of 10 cases of relapsing fever has shown that the Arneth index is deflected to the left. At the attack the older

polynuclears perish and are replaced by younger ones which are destroyed before they can reach maturity. Hence there is in the blood an increasing number of cells with the younger types of nuclei. The polynuclears are increased in number when an attack commences, but decrease up to the next attack, when they are again increased. The number of monocytes or large mononuclears does not fluctuate to the same extent but remains high even after an attack. It has been demonstrated that the large mononuclears are active in phagocyting the spirochaetes.

C. M. W.

Levaditi (C.) & Nicolau (S.). Action thérapeutique de l'hyposulfite double d'or et de sodium dans les spirilloses et les spirochétoses. [**Therapeutic Effect of Double Hyposulphite of Gold and Sodium in Spirillosis and Spirochaetosis.** *C.R. Soc. Biol.* 1926. Jan. 5. Vol. 93. No. 38. pp. 1571-1573. [5 refs.]

Experimenting with the gold salt the authors have found that a solution of 1 in 200 will immobilize the fowl spirochaete in one hour at 37°C., while a solution of 1 in 400 is inactive, unless it be mixed with extract of rabbit's liver. Furthermore, it was found that administered to fowls at a dose of 0·01 to 0·02 gm. per kilogram of body weight the birds were protected against inoculation with the spirochaete. It would appear that the drug has a definite spirochaeticidal action. The study of the action of a drug on organisms *in vitro* may be an important guide to its therapeutic properties. As a rule a substance which is highly toxic to organisms in a tube is neutralized when mixed with extract of liver and is therapeutically inactive. Gold chloride, for instance, which will destroy spirochaetes *in vitro* in a strength of 1 in 100,000, is partially neutralized by cellular proteins and has no curative action on experimental syphillis. The hyposulphite, though much less active when tested directly on spirochaetes, nevertheless has this action increased by organ extracts and is therapeutically efficient.

C. M. W.

Prigge (R.). Experimentelle Studien mit Syphilis- und Rekurrens-spirochäten. II. Die Sterilisierung mit Salvarsan und die Beziehungen der Immunität zur Persistenz der Spirochäten bei experimenteller Rekurrensinfektion der Mäuse. **Sterilization by Salvarsan, Relation of the Immunity to Persistence of the Spirochaetes in Experimental Infection of Mice.** —*Deut. Med. Woch.* 1926. Feb. 26. Vol. 52. No. 9. pp. 356-358. [11 refs.]

———. Die Sterilisierung mit Salvarsan und die Beziehungen der Immunität zur Persistenz der Spirochäten bei experimenteller Rekurrensinfektion der Mäuse.—*Dermat. Ztschr.* 1926. Apr. Vol. 47. Nos. 1-2. pp. 1-25. With 7 tables on folding plate. [26 refs.]

The author disagrees with Busschke that in mice spirochaetes of relapsing fever will persist in the brain substance after salvarsan treatment. He finds :

1. The experimentally produced disease in mice runs a course with two to four relapses and terminates in an immunity which is due to the definite development of antibodies and not to the persistence of spirochaetes in any situation.

2. After a natural recovery spirochaetes only rarely occur in the brain and never after a sterilizing dose of salvarsan. With insufficient salvarsan spirochaetes may persist in the brain but they occur also in the blood.

3. Buschke's claims were made without recognition of the possibility of spirochaetes inoculated to naturally recovered mice surviving in the brain and tissues for some time, of the importance of sufficient dosage of salvarsan and of the necessity of inoculating to fresh mice not only the brain substance but also the blood.

4. In the early stages of infection a new infection may be superimposed, as in the case of rabbit syphilis.

5. If treated early with a sufficient dose of salvarsan the infection in mice can be completely eradicated.

6. Buschke's conjecture that salvarsan treatment of relapsing fever and syphilis destroys the immunity is therefore contradicted.

C. M. W.

Krantz (Walther). Salvarsanwirkung bei der Rekurrensinfektion weisser Mäuse. [**Action of Salvarsan in Relapsing Fever in White Mice.**]—*Deut. Med. Woch.* 1926. Feb. 5. Vol. 52. No. 6. pp. 234-235. [3 refs.]

It has been demonstrated by Buschke and Kroò that, when mice infected with the relapsing fever spirochaete are treated with salvarsan, in a large percentage of cases the drug fails to eradicate the infection from the brain, as proved by inoculating it to other mice. The present writer describes experiments in which 40 mice were inoculated with spirochaetes and were treated with salvarsan in batches of 10 on the 1st, 2nd, 3rd and 4th days respectively, the spirochaetes present in the blood being more numerous on each successive day. Five days after the treatment the mice were killed and their brain substances inoculated to other mice to discover the presence or absence of spirochaetes. Of the 10 treated on the first day 3 had spirochaetes in the brain 5 days after. Of those treated on the 2nd day 5 had spirochaetes in the brain, while of those treated on the 3rd and 4th days, in spite of the fact that their infections were heavy when treated, none had demonstrable spirochaetes in the brain. It would appear therefore that the action of salvarsan is correlated with the development of antibodies which were evidently present in the blood in the later treated mice in greater amount than in those treated on the first and 2nd days. The old doctrine that salvarsan acts more efficiently in the early stages of infection is thus not necessarily correct.

C. M. W.

Steiner (G.) & Steinfeld (J.). Experimentelle Untersuchungen zur Pathologie und Therapie der Spirochätenkrankheiten. III. Zweitimpfung und Immunität bei experimenteller Recurrens. **Repeated Inoculation and Immunity in Experimental Relapsing Fever.**]—*Klin. Woch.* 1926. Mar. 19. Vol. 5. No. 12. pp. 499-502. [2 refs.]

After study of experimental relapsing fever in rats and mice the authors reach the following conclusions :

1. During the course of a mild primary infection it is possible to produce a superimposed and more intense infection by the inoculation of blood rich in spirochaetes.

2. Even when rats and mice are inoculated with the same virus and have infections of the same intensity the period of immunity following the infection varies.

3. In the later stages of immunity though inoculated spirochaetes give rise to no infection they can nevertheless be recovered from the blood.

4. This short survival of spirochaetes in the blood is prevented if the animals have previously been subjected to intraperitoneal or intracardiac inoculations of virulent spirochaetes, an observation which proves that such inoculations increase the immunity produced by an infection.

5. This increased immunity disappears in the course of a few weeks, so that after a further inoculation the spirochaetes again persist in the blood for a short time.

C. M. W.

Hoff (Hans) & Horn (Ludwig). Serologische Beiträge zur Rekurrenstherapie der progressiven Paralyse. [**Serological Contributions to the Relapsing Fever Treatment of G.P.I.**] —*Muench. Med. Woch.* 1926. Apr. 30. Vol. 73. No. 18. pp. 731-732. With 1 chart in text. [8 refs.]

In the treatment of general paralytics by inoculated relapsing fever the meninges appear to play an important part in the changes which occur, for it is found that in the cerebrospinal fluid there is an increase in the cell content and the albumin, associated with a turbidity and the presence of fine flocculi. The globulin reaction is also intensified, but whether this is another indication of inflammatory reaction cannot be stated, though the deterioration of the goldsol curve seems to be attributable to it. The changes persist for some time after treatment, a fact which probably accounts for the late occurrence of relapses. The Wassermann reaction is rarely influenced as far as the cerebrospinal fluid is concerned, but in many cases the serum shows an improvement, which, however, could not be correlated with the remission of symptoms.

C. M. W.

Hoff (Hans) & Silberstein (Fritz). Experimentelle Untersuchung ueber den Wirkungsmechanismus der Recurrensfiebertherapie bei der progressiven Paralyse. [**Investigation of the Mechanism of Action of Relapsing Fever Therapy in G.P.I.**] *Ztschr. f. d. gesamte exper. Med.* 1926. Mar. 3. Vol. 49. No. 1-3. pp. 294-301. With 6 curves. [9 refs.]

During the treatment of a series of cases of general paralysis with the spirochaetes of relapsing fever the changes in the opsonic titre of the blood serum and cerebrospinal fluid were investigated. It was noted that the opsonic titre as tested against staphylococci and *Bacillus coli* was increased progressively with each attack. The same changes were noted in the case of inoculated malaria. The superimposed infections thus bring about changes both in the blood and cerebrospinal fluid. The permeability of the meninges can be influenced by other means. If general paralytics are injected with increasing doses of cholera vaccine agglutinins appear in the blood but not in the cerebrospinal fluid. If typhoid vaccine is then injected subcutaneously agglutinins will appear both in the blood and cerebrospinal

fluid. As regards the effect of *Treponema pallidum* itself it was found that the serum of general paralytics and leucocytes had no effect on the organisms from cultures in that they were still infective to rabbits. On the other hand, if the serum were taken from cases treated with relapsing fever or malaria the serum and leucocytes affected the organisms in such a way that they ceased to be infective. Whatever be the exact mechanism of its action the relapsing fever spirochaete appears to act in the same way as the parasite of malaria.

C. M. W.

Miki (Riichi). **Experimental Studies on** *Spirocheta obermeieri.*]—*Fukuoka Ikadaigaku Zasshi (Jl. Fukuoka Med. College).* 1925. Apr. Vol. 18. No. 4. [Summarized in *Japan Med. World.* 1925. Dec. 15. Vol. 5. No. 12. p. 362.]

Investigations on the spirochaete of relapsing fever in experimental animals have shown that though 2·7 per cent. of animals born of infected parents were infected, this was not due to passage of spirochaetes through the uninjured placenta, but was due to infection during birth when maternal and foetal blood intermingled.

Farreras (P.). La fiebre recurrente hispánica y su transmisión por la garrapata del cerdo. **Relapsing Fever in Spain and its Transmission by Pig Ticks.**]—*Rev. Española de Med. y Cirug.* Barcelona. 1926. Apr. Vol. 9. No. 94. pp. 207-208.

Some remarks on relapsing fever in Spain, with special reference to its transmission by ticks, as demonstrated by de Buen.

C. M. W.

Ramsey (Thomas L.). **Bronchial Spirochetosis (Castellani).**—*Jl. Lab. & Clin. Med.* 1926. May. Vol. 11. No. 8. pp. 751-758. [36 refs.]

Attention is drawn to the occurrence of bronchial spirochaetosis in Ohio, seven cases of which are described. The disease is usually regarded as one of tropical origin, but this is evidently not the case. The course of the disease is usually acute and haemoptysis is a frequent symptom. There is ready response to treatment with arsenicals.

C. M. W.

Tournier (E.). Les affections pulmonaires à spirochètes de Madagascar. [**Spirochaetal Pulmonary Affections in Madagascar.**]—*Bull. Soc. Path. Exot.* 1926. Apr. 14. Vol. 19. No. 4. pp. 261-262.

There exist in Madagascar certain pulmonary syndromes which must be attributed to spirochaetal infection. They may be classed as bronchitis with blood-stained expectoration, pulmonary congestion or asthma. The last condition is common in the island and produces the characteristic symptoms. In all asthmatic cases spirochaetes have been demonstrated. The various conditions respond readily to arsenical treatment.

C. M. W.

Bezançon (Fernand) & Etchegoin (Eugenio). *Spirochaeta bronchialis* et gangrène pulmonaire. [*S. bronchialis* **and Pulmonary Gangrene.**] —*C. R. Soc. Biol.* 1926. Feb. 12. Vol. 94. No. 5. pp. 319-322. [3 refs.]

In 7 of 11 cases of pulmonary gangrene the authors have demonstrated in the sputum spirochaetes which appear to be analogous to that described by Castellani in 1905. It is 8 to 20 microns in length by 0·4 to 0·5 microns in breadth, and is thus larger than *Spirochaeta vincenti* but smaller than *Spirochaeta buccalis*. There is considerable difficulty in staining it in sputum unless the technique recommended by the authors is followed. A small portion of sputum is shaken vigorously in a tube with 1 cc. of distilled water. The tube is then kept in the incubator at 29° C. for 15 to 20 minutes, after which the surface film is removed by a fine capillary pipette. Thin films are made with the fluid. They are fixed in alcohol-ether and stained with Loeffler's flagellum stain.

C. M. W.

Alvarez Lopez (Anibal). Espiroquetosis broncopulmonar de Castellani. [**Bronchopulmonary Spirochaetosis (Castellani).** —*Crónica Méd.* Lima. 1925. Oct., Nov. & Dec. Vol. 42. Nos. 748, 749 & 750. pp. 295-307 ; 321-328 ; 368-376.

Though no fresh information is brought forward, this paper is of service in presenting a survey of a subject on which there has accumulated a large literature. The author deals briefly with spirochaetosis in general and with bronchopulmonary spirochaetosis in particular, and more especially as it exists in South America. He traces the history of the condition from Castellani's original description in 1904 to that of Mironesco to the Biological Society of Rumania in 1925, by means of a review of the numerous records during this period. He next deals similarly, but in somewhat more detail, with cases reported in South America, the first known being that of Vaccareza in the Argentine in 1920. A general account of the symptoms, physical signs, diagnosis and treatment is given, together with a description of the method of de Mello and Andrade for identifying spirochaetes by the "morphological index": the relation between the average length of 100 specimens and the number of turns, expressed as a fraction.

The final section of the paper gives details of two cases in Peru ; one by Corvetto reported in *Anales de la Facultad de Medicina* for 1918, the second by Ribeyro in *La Crónica Médica* in December of the same year. The sister of the former patient died of tuberculosis and the case is regarded as an association of the two conditions, tuberculosis and pulmonary spirochaetosis, "accepted as an entity by those who have made a study of the disease."

H. Harold Scott.

Franchini (G.). Spirochetosi bronco-polmonare. **Bronchopulmonary Spirochaetosis.** —*Pathologica.* 1926. Feb. 15. Vol. 18. No. 412 pp. 61-65. With 1 text fig.

An examination of cases of bronchial spirochaetosis, one of which is described in detail, has led the author to the opinion that the condition

cannot be regarded as a distinct disease but rather a group of diseases. The spirochaetes, which may or may not be associated with fusiform bacilli, are exceedingly polymorphic.

C. M. W.

Delamare (G.). L'identification des spirochètes bronchiques d'après quelques travaux récents. (Essai de classification provisoire.) [**Identification of Bronchial Spirochaetes.**]—*Bull. Acad. Méd.* 1926. May 11. 3rd Ser. Year 90. Vol. 95. No. 19. pp. 459-467. [14 refs.]

The paper contains a lengthy discussion of the question of the individuality of *Spirochaeta bronchialis*. In spite of the many dogmatic assertions that have been made the author believes that it is identical with the polymorphic form first described by Vincent and associated with the disease which bears his name.

C. M. W.

Delamare (G.). A propos de l'indice d'identification morphologique des spirochètes bronchiques. [**The Morphological Index of Bronchial Spirochaetes.**]—*C. R. Soc. Biol.* 1926. May 7. Vol. 94. No. 15. pp. 1141-1143. With 1 fig. [3 refs.]

By plotting the lengths of various spirochaetes according to the method of Froilano de Mello the author arrives at the conclusion that it affords no means of establishing the individuality of *Spirochaeta bronchialis*.

C. M. W.

Vincent (H.). La fuso-spirochétose bronchique. [**Fusospirochaetosis of the Bronchi.**]—*Bull. Acad. Méd.* 1926. Feb. 16. 3rd Ser. Year 90. Vol. 95. No. 7. pp. 143-146. [12 refs.]

——. Note sur la fuso-spirochétose bronchique. (A propos de la communication de M. G. Delamare.)—*C. R. Soc. Biol.* 1926. May 7. Vol. 94. No. 15. pp. 1143-1144. [4 refs.]

It is concluded that the so-called *Spirochaeta bronchialis* is no other than the spirochaete associated with Vincent's angina.

C. M. W.

Lins (Abdon). Notas sobre a espirochetose bronchopulmonar de Castellani. [**Bronchopulmonary Spirochaetosis (Castellani).**]—*Arch. Brasileiros de Med.* 1925. Aug. Vol. 15. No. 8. pp. 506-507.

The author saw two cases presenting bloodstained expectoration in which neither ova of Paragonimus nor acid-fast bacilli were found, but spirochaetes were numerous. For 15 days there was no amelioration; then neosalvarsan was given and the symptoms cleared up after the first dose. Other cases, however, do not yield so readily, it is stated, and the symptoms usually return after a certain time.

H. Harold Scott.

Koshina (M.), Shiozawa (S.) & Kitayama (K.). **Studies of *Leptospira hebdomadis*.**—*Jl. Experim. Med.* 1925. Dec. 1. Vol. 42. No. 6. pp. 873-895. [26 refs.]

An investigation of the disease known as akiyami which occurs in the Shida district of Shizuoka province in Japan has shown that it is

due to a leptospira which is morphologically very difficult to differentiate from *L. icterohaemorrhagiae* and *L. hebdomadis*. Serologically, however, the organisms appear to be of 2 types. One (type A), isolated from 3 of 16 cases, is highly virulent for guineapigs and is serologically distinct from the above-named organisms. The other (type B) appears to be identical with *L. hebdomadis*. The field mouse (*Microtus montebelli*) has been found to harbour type A.

C. M. W.

Kritschewsky (I. L.) & Tscherikower (R. S.). Ein neues Immunitätsphänomen gegen die *Spirochaeta icterogenes*. [**A New Phenomenon of Immunity to** *S. icterogenes*.]—*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1926. Feb. 20. Vol. 46. No. 3. pp. 207-215. [5 refs.]

A paper describing the production of a specific substance, Thrombocytobarine, in the blood of animals infected with relapsing fever spirochaetes has been reviewed (Brussin, *ante* p. 113). The authors have discovered that a similar specific substance is developed in the blood of rats and mice infected with the leptospira of Weil's disease but not in guineapigs. The serum of the animal added to citrated blood containing the leptospira causes the blood platelets to become attached to the organisms if the specific substance is present.

C. M. W.

Uhlenhuth & Grossmann. Zur Typenfrage der *Spirochaeta icterogenes*. [**Question of Type in** *S. icterogenes*.]—*Cent. f. Bakt.* 1. Abt. Orig. 1926. Vol. 97. No. 4-7. pp. 73-75. [1 ref.]

Working with the leptospira of Weil's disease and the similar organisms from water the authors have found that distinct serological strains exist. The water spirochaetes grow without exception in the serum of rats whereas the Weil's disease spirochaetes will sometimes fail to grow in this medium. Though it might be supposed that in cases of failure the rats from which the serum was taken had antibodies in the blood resulting from a latent infection, this is not always the case, for growth has been obtained in serum from rats the kidneys of which were found to be infected. If rabbits are inoculated with a strain of water spirochaete the serum develops antibodies which prevent growth of this strain and some, but not all, other strains when the serum is employed for culture media. It has been shown in this way that distinct serological races of water spirochaetes exist. Similarly by testing various pathogenic strains of spirochaetes isolated from man or rats it was found that serologically they could be separated into different strains. The serum prepared from one water strain prevented growth of a strain of the Weil's disease organism.

C. M. W.

Mesquita (Bruno Pereira). Espirochetoses intestinaes humanas. [**Intestinal Spirochaetosis in Man.**] *Arquivos Indo-Portugueses de Med. e Hist. Nat.* Nova-Goa. 1925. Vol. 2. pp. 21-70. With 5 figs. on 3 plates. [23 refs.]

In the first section of this article the author describes the *Spirochaeta eurygyrata*, often found in the faeces, and two other spirochaetes which

are denominated *S. Couceiri* and *S. Macfiei*, whose pathogenic powers have not been established.

In the second section several points are considered in greater detail: (1) In the examination of 51 subjects free from any symptoms of intestinal disturbance *S. eurygyrata* was found in 49. It is therefore inferred that to this organism no pathogenicity can be attributed. (2) Examination of 16 cases of intestinal infection, including amoebic dysentery, tuberculous enteritis and helminthiasis, revealed the presence of the spirochaete in all but one. (3) A study of the morphological characters of the spirochaete based on the relation between the length in microns and the number of curves. (4) A post mortem examination of the intestine of a case of tuberculous peritonitis showed that the spirochaete was present in the large intestine but absent from the small intestine. It was most numerous in the caecum and rectum, but was present in smaller numbers in the appendix and colon. (5) The mouth-spirochaetes may be found in the intestine and, since they retain their characters, they are easily distinguishable from *S. eurygyrata*. (6) Lastly, the effect of spirochaeticidal drugs was tried. Neosalvarsan intravenously or by lavage had no effect at all, nor had bismuth, trepol or neotrepol. Stovarsol, on the contrary, taken by the mouth for 6 days in succession was followed by rapid disappearance of the organism from the stools.

H. Harold Scott.

Bosselut (R.). Sur un spirochète sanguicole du chien domestique. [**A Blood-keeping Spirochaete of the Dog.**] —*Bull. Soc. Path. Exot.* 1925. Nov. 11. Vol. 18. No. 9. pp. 702-704. With 1 text fig.

A blood film made from a sick dog in Algeria was found to contain spirochaetes 8 to 22 microns in length. Six days later 3 cc. of blood were inoculated intravenously to another dog which was sent to the Pasteur Institute in Algiers where the original blood film had been sent for examination. The dog did not become infected but there is no mention of the presence or absence of spirochaetes in the blood of the first dog after the time of the first examination. The name *Spirochaeta canina* is given to the organism.

C. M. W.

Vervoort (H.). **Pseudo-Spirochetes or Leptospirae.**—*Amer. Jl. Trop. Med.* 1926. Mar. Vol. 6. No. 2. pp. 155-166. [1 ref.]

The author, who has recovered spirochaetes from dengue-like fevers in Sumatra (*Leptospira pyrogenes*), points out that in the cases described by him there is no question of the organisms having been mistaken for pseudospirochaetes or filaments derived from the red blood corpuscles, for they have been cultivated in phosphoric acid peptone water and other media. In connexion with the failure of observers to discover spirochaetes in dengue in other localities he points out that there is no precision as to what dengue actually is and that under this name what appear to be distinct diseases have been grouped.

C. M. W.

Noguchi (Hideyo). **Abnormal Bacteria Flagella in Cultures : their Resemblance to Spirochetes.**—*Jl. Amer. Med. Assoc.* 1926. May 1. Vol. 86. No. 18. pp. 1327-1329. With 3 text figs. [1 ref.]

Though attention has been called to the danger of confusing blood filaments with spirochaetes no one has yet pointed out that the detached flagella of certain bacteria which may be in the form of spirals may be the cause of error. The writer notes that on one or two occasions on which he was working with mixed cultures of flagellated bacteria and spirochaetes detached flagella have puzzled him and once led him to regard them as involution forms of spirochaetes.

As regards the structure of spirochaetes, it is noted that the relapsing fever type appears to consist of 3 main parts, namely the cytoplasm, the axial filament and the flagella. The cytoplasm is readily dissolved by bile, leaving the axial filament and flagella. The denuding process can be followed by means of dark field illumination. The same change occurs, though it is less marked, in the case of *Treponema pallidum*. The body of the organisms of the rat-bite fever group, as also the leptospiras, are dissolved completely, there being no indication of an axial filament. The great resemblance between the flagella of motile bacteria and the flagellar and axial spiral apparatus of certain spirochaetes suggests that they have a similar origin and supports the view that bacteria and spirochaetes are phylogenetically related.

C. M. W.

Reiter (Hans.) Ueber Fortzüchtung von Reinkulturen der Spirochaete pallida, Spirochaete dentium und Spirochaete recurrens. [**On the Maintenance of Pure Cultures of** *S. pallida*, *S. dentium* **and** *S. recurrens*.] —*Klin. Woch.* 1926. Mar. 12. Vol. 5. No. 11. pp. 444-445.

A description of media which the author has employed successfully for cultivation of spirochaetes.

C. M. W.

RAT-BITE FEVER.

Franchini (Giuseppe). Contributo allo studio del Sodòku. [**A Case of Sodoku.**]—*Riforma Med.* 1926. Mar. 15. Vol. 42. No. 11. pp. 243-244.

A patient who had been treated with a single injection of neosalvarsan after the diagnosis of rat-bite fever continued to suffer from febrile attacks during the next 4 years, associated with glandular enlargement and the development of subcutaneous thickenings and small tumours which led to the formation of furuncles. Though no organisms could be discovered the patient was given a course of neosalvarsan injections which brought about a complete cure.

C. M. Wenyon.

Curtis (E. S.). **Report of a Case of Rat-Bite Fever.** —*China Med. Jl.* 1926. Feb. Vol. 40. No. 2. pp. 158-159.

An account of a case of rat-bite fever at Funing in which the period of incubation was exactly a fortnight. The attacks of fever lasted

only 2 days and the rash was represented only by 3 erythematous patches which appeared during the 2nd febrile period. Three injections of small doses of 914 cured the condition.

C. M. W.

Row (R.). **On the Present Position of the Rat-Bite Spirochaete (Bombay).**—*Indian Jl. Med. Res.* 1926. Jan. Vol. 13. No. 3. pp. 445-448. With 17 figs on 1 plate. [12 refs.]

In the early descriptions of the spirillum of rat-bite fever by Japanese workers the length of the organism was given as being midway between that of *S. pallida* and *S. duttoni*, so that when the author discovered a short spirillum in cases of the disease in Bombay he regarded it as a distinct species which he named *Spirochaeta petit.* It appears, however, that there was some confusion in the early accounts, for subsequent workers in Japan describe the organism as a short one similar to that which has been discovered in other localities. In most cases it has been possible to demonstrate terminal flagella but the author has failed to do so in the case of the Bombay strain. Parmanand, however, claims to have done so and regards the Bombay organism as the same as that found elsewhere. The author in the present paper again states that he has been unable to demonstrate flagella and is evidently still of the opinion that the form described by him is distinct. Owing to the difficulty in staining the flagella it is evident that the question cannot be finally answered till strains from other localities are compared side by side with the Bombay strain under identical conditions of animal infections and microscopic technique.

C. M. W.

Theiler (Max). **Experimental Rat-Bite Fever.**—*Amer. Jl. Trop. Med.* 1926. Mar. Vol. 6. No. 2. pp. 131-141. With 6 figs. [18 refs.]

Investigations on the spirillum of rat-bite fever isolated from an infant by inoculation of blood into guineapigs and white mice showed that the organism was identical with *Spirochaeta morsus muris.* White mice and rats are readily infected. They show no symptoms but harbour the organism for long periods. Guineapigs after an incubation period of 6 to 15 days develop fever, enlargement of the lymphatic glands, inflammation and, later, induration of the external genitals and loss of hair. Rabbits were infected by subcutaneous, intradermal and intratesticular injections. About half the animals developed no symptoms but the blood remained infective for guineapigs for 3 weeks.

C. M. W.

Joekes (Th.). **Cultivation of the Spirillum of Rat-Bite Fever.**—*Lancet.* 1925. Dec. 12. pp. 1225-1226. [9 refs.]

The author has succeeded in cultivating the organism of rat-bite fever which was found in over 25 per cent. of the wild rats of London. The medium used was an ordinary inspissated horse serum slope as employed for the growth of Klebs-Loeffler bacilli over which was poured a medium which had been used by Vervoort for the cultivation of spirochaetes. Vervoort's medium consists of peptone 1 gm. dissolved in 900 cc. of distilled water to which 3 cc. of normal phosphoric acid solution had been added. The medium (pH 7·2–7·6) consists of a

slope completely immersed in the liquid. When once a culture had been established subculture was easily made in 1 per cent. glucose broth, preferably with the addition of a little rabbit blood. The primary culture was obtained by inoculating the medium with blood of an infected guineapig and incubating at 37° C. In subculture growth occurred both in the incubator and at the room temperature. All cultures contained a coliform bacillus from which it had not been possible to separate the spirillum. Whether this is a condition of obligatory symbiosis has not yet been determined.

C. M. W.

Ruys (A. Charlotte). Der Erreger der Rattenbisskrankheit. **The Agent of Rat-Bite Fever.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1926. Mar. 1. Vol. 30. No. 3. pp. 112-121. With 8 text figs. [8 refs.]

During the examination of 250 rats in Amsterdam it was found that 3 of them harboured a small spirillum which appears to be identical with that of rat-bite fever. In spite of the fact that it was demonstrated that infected rats transmitted the infection to guineapigs and rats by their bites and that infected mice did the same to other mice the spirillum was found neither in the saliva nor in the secretions from the nose and eyes. A strain from a human case compared with that from rats showed that the two were identical, though a mouse strain, in spite of morphological identity, appeared to be serologically different. The sera of monkeys, rabbits and guineapigs inoculated with the rat or human strains had a lethal and lytic effect on all three strains, whereas the serum of rabbits inoculated with the mouse strain had no action on either the mouse organism or the others. It is pointed out that the organism is not a spiral like a corkscrew but a flat object with undulations in one plane. The simplest method for demonstrating the organism is by dark ground examination, while the thick film method is very useful for the detection of scanty infections. It is concluded that the organism is not a spirochaete but a spirillum.

C. M. W.

Worms (Werner). Vergleichende experimentelle Untersuchungen mit dem Erreger der Rattenbisskrankheit und der Mäusespirille. [**Comparative Investigations with the Agent of Rat-Bite Fever and Mouse Spirilla.**]—*Cent. f. Bakt.* 1. Abt. Orig. 1926. Apr. 1. Vol. 98. No. 3-4. pp. 195-211. With 4 text figs. [32 refs.]

The author has been able to compare the spirillum isolated from a case of Japanese rat-bite fever with one obtained from the blood of mice in Germany. As a result of his investigations, which included morphological studies of the two organisms, experimental inoculation of rats, mice, guineapigs and rabbits and serological and chemotherapeutic tests, he has come to the conclusion that the two organisms, even if they are not identical, are extraordinarily alike. He agrees with Zuelzer (1921), Adachi (1921) and Robertson (1924) that the organisms of this type are not spirochaetes but spirilla.

C. M. W.

i. Gall (Curtis M.) **Rat-Bite Fever : Report of Case.**—*China Med. Jl.* 1925. Nov. Vol 39. No. 11. p. 1029.

ii. Ward (John LaBruce). **Rat-Bite Fever: Case Report.**—*Southern Med. Jl.* 1926. Mar. Vol. 19. No. 3. pp. 182-183.

iii. Nejrotti (G. Mario). Sodòku da morso di gatto. [**Sodoku from Cat Bite.**]—*Policlinico.* Sez. Prat. 1926. May 24. Vol. 33. No. 21. pp. 724-727. [51 refs.]

iv. Sorokin (G. E.) Zur Klinik der Rattenbisskrankheit. [**Case of Rat-Bite Fever.**]—*Russian Jl. Trop. Med.* 1926. No. 1. German summary p. 27. [In Russian pp. 9-10. With 1 chart. 1 ref.]

v Lanford (John A.). **Etiology, Pathology and Distribution of Rat Bite Fever (Sodoku).**—*Southern Med. Jl.* 1926. Mar. Vol. 19. No. 3. pp. 179-182. With 1 chart in text. [22 refs.]

i. Description of a case of rat-bite fever in a Chinese girl aged 12 at Kiulungkiang, Yunnan. Injections of atoxyl brought about recovery.

ii. Description of a case of rat-bite fever in Texas.

iii. The illness described followed the bite of a cat. It resembled rat-bite fever in that repeated febrile attacks occurred with eruptions on the bitten hand and body.

iv. A detailed description of a case of rat-bite fever in which it was not possible to demonstrate the spirillum though there was rapid response to treatment with arsenobenzol.

v. A general account of the disease.

C. M. W.

INFECTIOUS JAUNDICE.

Walch (E. W.) & Walch-Sorgdrager (G. B.). Enkele opmerkingen over *Leptospira icterohaemorrhagiae.* [**Some Remarks on *Leptospira icterohaemorrhagiae.***]—*Nederl. Tijdschr. v. Geneesk.* 1925. Oct. 3. Year 69. 2nd Half. No. 14. pp. 1535-1542. With 1 text fig. [13 refs.]

Discussion of some of the methods used in the search for Leptospira in Baltimore rats. To demonstrate their presence both direct microscopical examination and inoculation of animals should be used. An apparently negative inoculation may be tested by the subsequent injection of a highly virulent strain of Leptospira but the test can only be relied upon if the negative result of the first inoculation was due, not to lack of virulence of the strain introduced, but to other factors, as strains of low virulence produce a very limited amount of antibodies. Once (out of 9 trials) a filtrate, obtained by filtering through a Berkefeld V filter a liver emulsion containing Leptospira, proved virulent for guineapigs, though Leptospira could not be seen in it even after concentration on an agar-filter. It was noted, however, that the cultured forms of Leptospira were able to pass through Berkefeld filters V. N and W. Sometimes guineapigs die, showing the classical clinical symptoms, without Leptospira being detected. In such cases their presence in the liver could sometimes be demonstrated by staining sections by Levaditi's method. This observation, together with that of the passage of culture-leptospira through filters, does not favour the existence of a granular phase, although it does not disprove it.

N. H. Swellengrebel.

Schüffner (W.) & Ruys (Charlotte). Nieuwe gevallen van ziekte van Weil. **Fresh Cases of Weil's Disease.** —*Nederl. Tijdschr. v. Geneesk.* 1925. Aug. 29. Year 69. 2nd Half. No. 9. pp. 1020-1025. [8 refs.]

Including two cases reported in this paper and one described in the beginning of 1925 three Dutch cases of Weil's disease are known in which Leptospira has been found. In two cases the disease commenced 9 and 11 days after the patient fell into a ditch or canal. Two cases ended fatally. The cultivated Leptospira showed agglutination and lysis with the patients' serum in a dilution of 1:5000 (15th day), 1:2500 (24th day), 1:1000 (44th day). The patients' serum had the same action on the three human strains and on one strain of Dutch rat-leptospira. Two other Dutch rat strains and a Sumatran human strain (*Leptospira pyrogenes* Vervoort) remained uninfluenced.

N. H. Swellengrebel.

Walch (E. W.) Demonstratie van een Leptospira, geïsoleerd bij een patient, die klinisch het beeld eener Weilsche ziekte had vertoond. **Demonstration of a Leptospira isolated from a Case which was clinically Weil's Disease.** —*Geneesk. Tijdschr. v. Nederl.-Indië.* 1926. Vol. 66. No. 1. pp. 115-116.

The organism was discovered in the peritoneal cavity of inoculated guineapigs which were not seriously affected. The strain showed an increase in virulence in sub-inoculated animals.

W. J. Bais.

Adamski (Jan). Przyczynek do zakażeń laboratoryjnych krętkami choroby Weil'a (leptospira icterohaemorrhagiae). Sur un cas de spirochétose ictérohémorrhagique par infection au laboratoire. **Case of Laboratory Infection with Icterohaemorrhagic Spirochaetosis.** —*Medycyna Doświadczalna i Społeczna.* Warsaw. 1925. Sept.-Oct. Vol. 5. No. 3-4. pp. 221-224. French summary p. 225. [7 refs.]

Working with cultures of *Leptospira icterohaemorrhagiae* isolated from rats the author accidentally contaminated his conjunctiva with the fluid. After an incubation period of 9 days, rigors, muscular pains, headache, hyperaesthesia of the eyeballs and a temperature of 100° F. initiated an illness which was proved by the intraperitoneal inoculation of guineapigs with blood to be due to leptospira. On the third day the liver was slightly enlarged while the urine contained albumin, red blood corpuscles and casts. The temperature reached 103·3° F. Improvement was evident on the 6th day and by the 8th day all symptoms had disappeared. The serum in a dose of 2 cc. protected guineapigs against infection when injected with 1 cc. of virulent culture.

C. M. Wenyon.

Reiter (Hans). Experimentelle Studien ueber die stumme Infektion und ihre Folgen bei Weilscher Krankheit und bei Nagana. **Occult Infection and its Results in Weil's Disease and Nagana.** —*Deut. Med. Woch.* 1926. Mar. 12. Vol. 52. No. 11. pp. 445-447.

The author demonstrates that it is possible, by the use of attenuated viruses, to produce in guineapigs abortive infections with the leptospira

of Weil's disease. Such animals develop an immunity which protects them against inoculation with virulent organisms. Comparing these results with those obtained with a nagana virus it was found that no such abortive infections could be produced with the trypanosomes and accordingly no protective immunity.

C. M. W.

Pettit (Auguste). La sérothérapie des spirochétoses ictéro-hémorragiques et de la poliomyélite. [**Serotherapy of Spirochaetosis Icterohaemorrhagica.**]—*Progrès Méd.* 1926. Feb. 20. pp. 279-289.

The paper describes the method of preparation of anti-Weil's-disease serum by the injection of horses with cultures of *Leptospira icterohaemorrhagiae*. The use of the serum in France is limited but all hospitals are agreed that it should be administered in severe cases.

C. M. W.

Widal (F.) & Weissenbach (R. J.). Ictère spirochétosique à recrudescence fébrile. Bacillémie et bacillurie concomitantes à bacille paratyphique. [**Spirochaetal Jaundice with Recurrence of Fever; Paratyphoid Bacilli concomitant.**]—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1926. Mar. 18. Year 42. 3rd Ser. Vol. 50. No. 10. pp. 434-448. With 1 chart in text. [10 refs.]

Bruhl (I.) & Ferru (M.). Ictère infectieux de nature et d'étiologie discutables, spirochétosique ou paratyphique. [**Infectious Jaundice of Uncertain Origin; Spirochaetal or Paratyphoid.**]—*Ibid.* Apr. 1. No. 13. pp. 512-515.

The two communications were stimulated by the publication in an earlier number of the same journal (Feb. 1. 1926) by Pagniez and Escolier, and May and Boulin of accounts of two cases which, though clinically resembling Weil's disease, gave no indication of a leptospira infection. The case now reported by Bruhl and Ferru was of the same type but yielded in blood culture and guineapig inoculations an organism of the paratyphosus B type, while the serum gave a positive reaction with the leptospira of Weil's disease. The case described by Widal and Weissenbach is very similar. Leptospira was not isolated but the serum was definitely active against this organism. Furthermore, on two occasions from the blood and on many occasions from the urine a bacillus similar to that noted by Bruhl and Ferru was isolated. It was agglutinated by the patient's serum at 1-5000 but was not agglutinated, even in dilutions of 1-30, by typhoid, paratyphoid A and B, or Gaertner sera. If the serological reaction as a test for leptospira infection has the value usually attributed to it then it has to be admitted that in these cases a double infection occurred.

C. M. W.

Adamski (Jean). Contribution à l'étude de la biologie de *Leptospira icterohaemorrhagiae*. [**The Biology of** *L. icterohaemorrhagiae*.]—*C. R. Soc. Biol.* . 1926. May 14. Vol. 94. No. 16. pp. 1206-1207.

The author has found that in a medium consisting of dilute rabbit serum leptospira will remain alive and apparently normal for 6 weeks

at a temperature of 37° C., 3 months at a temperature of 30° C. and 7 months at room temperature. In a medium containing 0·2 per cent. of guineapig blood kept at 30° C. living and normal organisms were present after 16 months. The organisms develop better in medium made with serum which has not been heated to 58° C.

C. M. W.

Lins (Abdon). Novas observações do *Leptospira icterohemorrhagiae* nos ratos do Rio de Janeiro. [*L. icterohaemorrhagiae* **in Rats in Rio de Janeiro.**]—*Brazil-Medico.* 1925. Oct. 31. Year 39. Vol. 2. No. 18. pp. 243-246. [28 refs.]

An examination of 30 rats in Rio de Janeiro for *Leptospira icterohaemorrhagiae* during 1923 and 3 months in 1925 has resulted in the discovery of 7 infections so that it is not improbable that infectious jaundice will appear in the city.

C. M. W.

Mac Dowel (Affonso). Dois casos de espirochetose. [**Two Cases of Spirochaetosis.**]—*Brazil Medico.* 1925. Sept. 19. Year 39. Vol. 2. No. 12. pp. 169–171.

Two cases are recorded briefly, one a boy of 16 years of age, the other of 14 years, with symptoms of fever, and icteric tinge and, in the latter, wasting and gastrointestinal disturbance. In the urine of both spirochaetes were found and in the faeces also of the second patient.

The first was given 10 injections of "914," each of 0·15 gm., the second was given the same followed by five injections of 0·30 gm. every three days. Cure resulted in both.

H. Harold Scott.

Elders (C.). Over de kliniek der ziekte van Weil. [**Case of Weil's Disease.**]—Reprinted from *Geneesk. Gids.* 1925. Apr. 17. Vol. 3. No. 16. pp. 365-371. With 1 chart in text.

Description of a fever case characterized by a primary attack and two relapses in a European in Deli (Sumatra) observed in 1908 and now recognized by the author as a case of Weil's disease.

N. H. Swellengrebel.

i. Kato (Juichi). **On Spirocheta-like Bodies in the Blood.**]—*Juzenkwai Zasshi* (*Jl. Juzen Med. Soc.*). 1925. Apr. Vol. 30. No. 4. [Summarized in *Japan Med. World.* 1925. Dec. 15. Vol. 5. No. 12. p. 358.]

ii. Hoffmann (W. H.). Los Leptospiras y las Leptospirilosis. [**Leptospiras and Leptospirillosis.**] *Semana Méd.* 1925. Apr. 23. Vol. 32. No. 17. pp. 932–940. With 12 text figs.

iii. Hoffmann (W. H.). Die Leptospirillosen. [**Leptospirillosis.**] *Muench. Med. Woch.* 1926. Apr. 9. Vol. 73. No. 15. pp. 611–614.

i. Observations on the spirochaete-like bodies which occur in blood showed that they were formed from the red blood corpuscles and platelets of both healthy and sick persons. They could be produced by pressure

or by merely allowing blood to stand for 24 hours. They were dissolved by pepsin or papain and consisted of protein but not fibrin, lipoid, glycogen or nuclear protein.

C. M. W.

ii. This paper covers the same ground as previous publications by this author. Of the figures embodied in the text that representing the lime-cast in the renal tubules is good, as is also the chart showing the blood-changes in experimental infections of guinea-pigs with *L. icteroides*. The reproduction of the rest is not up to the same level.

H. Harold Scott.

iii. The paper, which is a summary of present knowledge regarding spirochaetes, particularly the leptospiras, contains no new information.

C. M. W.

YELLOW FEVER.

Hanson (Henry). **General Report on the Yellow Fever Campaign in Colombia, May, 1923, to December 31, 1924.**—*Amer. Jl. Trop. Med.* 1925. Nov. Vol. 5. No. 6. pp. 393-400.

In 1923 it became evident that yellow fever occurred in Colombia and the International Health Board was asked to cooperate in the control of the disease and its elimination from the country. A commission was appointed under the direction of Dr. Hanson and a comprehensive control campaign put into operation. The centre was Bucaramanga but it was decided to organize work also on the main points on the Magdalen river and the coast. As a result of the operations, which are similar to those carried out elsewhere, it is believed that now (January 5th, 1925) yellow fever no longer exists in Colombia, though outside the actual areas worked the mosquito index is high and the condition such that the greater part of the country would become infected if the disease were introduced. At the present time the safety of Colombia is in the absence of yellow fever from Ecuador, Panama and Venezuela.

C. M. Wenyon.

Brau (M.). Récentes manifestations de fièvre jaune en Afrique occidentale française. [**Recent Appearances of Yellow Fever in French West Africa.**] *Bull. Soc. Path. Exot.* 1926. Mar. 10. Vol. 19. No. 3. pp. 237-242. [1 ref.]

Reviewing the outbreaks of yellow fever which have occurred in the colonies of French West Africa since 1922 the author arrives at several conclusions. At Ségou in 1922 most of the victims lived in a house belonging to the Compagnie Française de l'A.O.F.; at Grand Bassam in the same year several cases occurred in the Atlantic Hotel; at Abomey Bohicon in 1924 several cases were grouped around the dwelling of a certain engineer who was himself a victim. Similarly in Liberia, the outbreak, noted in another paper by Bouet, centred round the premises of the Elder Dempster Company, while at Toukoto in 1925 one house harboured three cases of which two were fatal. In all instances succeeding cases occurred within only a short distance of the primary foci. These facts indicate the importance of carrying out the most active anti-stegomyia measures in the immediate locality of the first case. Another point brought out is the mistaken diagnosis of the first cases which are frequently reported as cerebral malaria or similar conditions. The author thinks that a diagnosis clinically made is more likely to be correct than one which is based on a laboratory finding, which may be misleading and lead to neglect of the sanitary measures which otherwise would have been adopted. The three fundamental signs of yellow fever, viz.: the fever, the haemoglobinuric vomiting [? black vomit] and the jaundice, have been recognized from early times. Other symptoms are, however, of value in helping an early diagnosis, which is of such supreme importance from the point of view of prophylaxis. Fever of a continued type is usually the first symptom noted and with it is severe and often intolerable headache associated with marked photophobia. The temperature rarely rises to 104° F. and usually oscillates about 101·1° F. Albumin is constantly present in the urine, which is scanty and highly coloured. Bouet found about

2 gm. of albumin per litre of urine. Early vomiting of alimentary or bilious material, often showing black granules, is a feature which has hitherto not received sufficient attention, but is often described by the patients themselves. It is quite distinct from the characteristic black vomit which appears later. As regards the jaundice it commences on the third day and is first noted in the conjunctivae, a diagnostic sign which, as BOUET remarks, is of special value in the case of the negro. The jaundice reaches its greatest intensity later in the disease and persists with tenacity during convalescence. Though early diagnoses may lead to errors they err on the safe side from the point of view of public health.

C. M. W.

ABBATUCCI (S). Y a-t-il eu des cas de fièvre jaune au Soudan en Octobre-Novembre 1925? [**Was there Yellow Fever in the French Soudan in Oct.-Nov. 1925?**]—*Presse Méd.* 1926. Apr. 3. Vol. 34. No. 27. pp. 428-429.

During October and November 1925 six deaths occurred amongst the European population at Toukoto, Upper Senegal. As some of these cases showed symptoms which might be attributed to yellow fever the disease was reported as such to the Minister for the Colonies. The author of the present note points out that this diagnosis could only be considered for three of the cases but that even in these there is considerable doubt, for no cases occurred amongst the native population, while no systematic search was made for the spirochaetes of relapsing fever which, as has been already noted, can be associated with many of the symptoms of yellow fever.

C. M. W.

BOUET (G.). Une épidémie de fièvre jaune au Libéria. [**An Epidemic of Yellow Fever in Liberia.**]—*Bull. Soc. Path. Exot.* 1925. Nov. 11. Vol. 18. No. 9. pp. 746-753.

During the last week of May 1925 a European became ill in Monrovia and died in four days of a disease diagnosed cerebral malaria. It would appear, however, that the symptoms were those of yellow fever, which was diagnosed by the writer of the paper in six cases attended by him during July and August and in two further cases which occurred in September, one of which was the German Consul General who had, moreover, received two injections of NOGUCHI'S vaccine (the second 12 days before he became ill), and the other an American woman who had resided in Liberia for 25 years. The two last cases died on the third and fourth days of the illness while of the 6 cases attended by the writer two died. The writer points out that yellow fever is a disease with which he is familiar and that in his opinion there is no doubt as to the existence of the disease in Liberia.

C. M. W.

HOFFMANN (W. H.). **Anatomical Observations on the Yellow Fever Problem in Africa.**—*Jl. Trop. Med. & Hyg.* 1926. Mar. 1. Vol. 29. No. 5. pp. 69-70. With 2 text figs. [1 ref.]

The author obtained from Dr. YOUNG of Accra kidney tissues from 4 cases of supposed West African yellow fever. It was noted that

the severe nephritis and the haemorrhages and blood casts characteristic of yellow fever were not present nor was there any indication of necrotic desquamation of the epithelium or lime casts. Though he admits that the study described is incomplete, the author cannot convince himself that the tissues belonged to cases of true yellow fever.

C. M. W.

Le Fanu (G. E. H.). **Yellow Fever at Nsawam The Case of Mr. C.** *Gold Coast Rep. Med. & San. Dept. for Period Apr. 1924–Mar. 1925.* Appendix D. p. 66.

The report deals with a case of yellow fever in a European who was suddenly taken ill at Nsawam on July 10th, 1924, and was admitted to the Accra European Hospital on July 15th. On July 13th vomiting of matter "like cocoa" commenced. On admission to hospital the vomiting continued, the sclerae were yellow, the lips cyanosed, and the urine contained cellular detritus and granular casts and gave a heavy deposit of albumen. On July 16th the vomiting continued, there was a black fluid stool and numerous petechiae appeared over the entire body. The condition became worse on July 17th and 18th and there was typical black vomit on July 19th. The urine was scanty and the vomiting continued till the patient's death on July 20th.

C. M. W.

Hanson (Henry). **Personal Experiences in an Attack of Yellow Fever.** —*Jl. Amer. Med. Assoc.* 1926. Feb. 20. Vol. 86. No. 8. pp. 548-549.

The paper is an interesting personal experience of yellow fever contracted by the writer during his work in Peru in 1919. The method of his infection is uncertain though he gives for what it is worth a history of first becoming ill at 2 a.m. four or five days after contaminating a finger with blood from undoubted cases of the disease. He mentions the case of another doctor who developed yellow fever at about the same time 4½ days after pricking his finger at an autopsy. In the author's case the onset showed itself by a strange feeling of uneasiness followed by a peculiar type of sore throat and a taste like that of blood in the mouth. A moderate headache developed, followed by a marked soreness of the back which at first seemed to be localized in two large tender spots over the kidneys. Profound prostration supervened and was accompanied by a feeling of general distress, with sensations of abdominal tenderness in the epigastric and liver regions. Though the temperature was never especially high there seemed to be pronounced toxaemia as evidenced by irregularity of the heart's action. The kidneys almost ceased to function. The prostration continued to be profound up to the 5th day and there were nervous manifestations of alternating excitability and depression. No mention is made of the usual intestinal symptoms, which were presumably absent. Five important points to be observed in the care and treatment of cases of yellow fever are given as follows:

1. Absolute rest in bed from the first onset of symptoms to convalescence.
2. Food of all kinds, even milk or albumins, should be withheld until convalescence is established.
3. A cathartic which is not too drastic should be given as early as possible.

4. As much water as can possibly be drunk without causing vomiting should be given.

5. All visiting should be prohibited. In addition during periods of depression small doses of a good grade whisky or brandy and also small doses of champagne with cracked ice may be administered. When food is commenced it should be soft and light for a period of two weeks.

C. M. W.

Boëz (L.). Travaux récents sur l'étiologie de la fièvre jaune. [**Recent Work on the Etiology of Yellow Fever.**]—*Rev. d'Hygiène.* 1926. Jan. Vol. 48. No. 1. pp. 1–23. With 1 text fig. [33 refs.]

As its title indicates, this paper is a review of the subject of the etiology of yellow fever and deals chiefly with the work of Noguchi and others on *Leptospira icteroides* and its relation to the disease.

C. M. W.

Dunn (Lawrence H.) & Hanson (Henry). **Prevalence of the Yellow Fever Mosquito, *Aedes aegypti* (Linn.), in Colombia.**—*Amer. Jl. Trop. Med.* 1925. Nov. Vol. 5. No. 6. pp. 401–418. With 1 map in text.

In connexion with the work of the yellow fever commission [see Hanson above] information regarding the distribution of *Aëdes aegypti* in various places in Colombia was obtained. The present paper describes in detail the evidence of mosquito breeding and its intensity in the 56 localities investigated from this point of view.

C. M. W.

Heagerty (J. J.). **Mal de Siam.**—*Canadian Med. Assoc. Jl.* 1925. Dec. Vol. 15. No. 12. pp. 1243–1245.

The paper refers to an epidemic which broke out in Quebec in 1710. It was diagnosed as Mal de Siam,* a name given to yellow fever at that time, and there is little reason to doubt that the diagnosis was correct. The author notes that in Allbutt's *System of Medicine* it is stated that yellow fever was epidemic in Quebec in 1805 and in Halifax in 1861, but he has been quite unable to find any record of these outbreaks, though in 1805 the disease was epidemic in New York.

C. M. W.

* "So called because of the general belief in early colonial days that the disease had been imported from Siam. It is mentioned by Labat, Chevalon, Desportes, Moreau de Saint-Mery, and other chroniclers of the period and was known by this name in Martinique and San Domingo near the close of the seventeenth century. It is found designated by this name in the old Government and local records of these islands."—Augustin. *History of Yellow Fever.* 1909. p. 79.

From further information in Augustin's book it appears that in consequence of an insurrection in Siam in 1688 a ship-of-war brought French settlers away and, driven out of its course by storms, reached Martinique, after having called (according to one account) at a Brazilian port. In any case, over 100 persons died of *Typhus miasmatique ataxique putride jaune*, the unhandy name by which yellow fever was then known to the French.—Ed.

CHOLERA.

Yui (C. Voonping). **A Few Practical Hints for the Clinical Diagnosis and Treatment of Cholera.**—*Nat. Med. Jl. China.* 1925. Dec. Vol. 11. No. 6. pp. 426-433.

The first and most essential step in the successful treatment of cholera is an early diagnosis based on clinical observation rather than on the findings of the laboratory. There are two diseases which may be mistaken for cholera:—"ptomaine" poisoning and acute bacillary dysentery; but in such cases the process of dehydration is not so sudden or so marked. In early stages, before dehydration, camphor, brandy, chlorodyne, and the essential oils mixture may be given. The last named is very useful in the early stages. [This *Bulletin*, Vol. 21, p. 885 (Tomb).] The author does not recommend this mixture for the later stages of cholera. With collapse saline injections are of most value. If veins are difficult to find transfusion may be performed into the peritoneum or under the breast. After introduction of 2 to 4 pints of saline into the peritoneal cavity veins soon become prominent and intravenous injection can be carried out. Two pints of saline may be injected under the breast of a woman before looking for the veins. Desperate cases need more than 20 pints. It is important to stop transfusion at once if there is any sign of distress or increased frequency of breathing. The author states that no food should be given for 48 hours after transfusion. He also lays down rules for subsequent diet. He draws attention to toxaemia, uraemia, and acidosis, and advises that cholera patients should be kept in hospital during convalescence so long as they are passing cholera vibrios. These may be present for 1 to 6 weeks, and as a carrier the patient will be a danger to the community if he goes home too early.

J. H. Tull Walsh.

Marshall (W. J.). **An Account of an Outbreak of Cholera at Goalundo Ghat.**—*Indian Med. Gaz.* 1926. Jan. Vol. 61. No. 1. pp. 4-7. With 1 text fig.

This is in itself a report of an epidemic showing no new features; but the table is of interest as it shows a general decrease in mortality since 1915.

Year.	Admissions.	Deaths.	Mortality.
1915	73	45	61·64
1916	61	26	42·62
1917	55	18	32·73
1918	72	25	34·71
1919	322*	165	51·24
1920	32	7	21·87
1921	84	19	22·62
1922	37	7	18·92
1923	68	5	7·35
1924	34	7	20·85
1925 (up to 28–10–25)	44	4	9·09

* Principally famine-stricken tea-garden coolies.

J. H. T. W.

Maruyama (Y.) & Ko-Ran. **On the Strains of Cholera Bacilli isolated from this Year's Cases in Taihoku.**—*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. of Formosa*). 1925. Dec. No. 249. English summary p. 7. [In Japanese.]

Cholera infection was carried into Taihoku, from Foochow, on Sept. 25th and Oct. 3rd, 1925. There were eight cases in all, four of which were bacillus carriers. The authors examined the bacilli isolated from these cases and found that they could be divided into two groups according to their immunity reactions, especially agglutination, and that these groups coincided exactly with the grouping of the two outbreaks, each belonging to a different group.

J. H. T. W.

Eisler (M.) & Kovács (N.). Ueber das Verhältnis des Präzipitinogens und Toxins in toxischen Choleravibrionen und deren Beteiligung an dem Flockungsprozess durch spezifische Sera. [**Relationship of Precipitinogen and Toxin of Toxic Cholera Vibrios.**]—*Wien. Klin. Woch.* 1926. Apr. 22. Vol. 39. No. 17. pp. 469-70.

The work of Ramon on the use of a precipitation test for the measurement of the potency of diphtheria toxin and antitoxin implies that the toxin is precipitated by the antitoxin. Eisler and Kovács investigate this point for the toxic (haemolytic) cholera vibrios and conclude that in this case there is no true flocculation of toxin by antitoxin. An adsorption of toxin by the flocculi resulting from the combination—cholera-precipitable substance and cholera precipitin—takes place. Thus toxin disappears from a mixture of toxic bouillon, freed from its bacteria, and specific precipitin serum; but this is not a precipitation of toxin by antitoxin. It may be equally well produced by the flocculi from the mixture of normal horse serum with its precipitin, if these are added to toxic bouillon.

W. F. Harvey.

Tsunetsugu (Hiroshiro). [**Experimental Studies on the Transmission of *Bacillus Typhosus* and *Vibrio Cholerae* into the Rabbit's Gall Bladder.**] —*Keio Igaku* (*Jl. Keio Med. Soc.*). 1925. Apr. Vol. 5. No. 4. [Summarized in *Japan Med. World.* 1925. Dec. 15. Vol. 5. No. 12. p. 358.]

The author always obtained positive results when injecting these bacteria into the veins of rabbits of which the bile ducts had been ligatured. He considers that the appearance of these bacilli in the gall bladder did not originate through the capillary bile tubes, but more probably through the blood capillaries.

J. H. T. W.

Maitra (G. C.) & Basu (J. B.). **Bacteriological Study of Stools of 746 Clinical Cholera Cases in Calcutta.**—*Indian Med. Gaz.* 1925. Dec. Vol. 60. No. 12. pp. 570–571. [7 refs.]

Routine laboratory work—see this *Bulletin*, Vol. 21, p. 887 (Maitra & Basu).

J. H. T. W.

Fujioka (Nagamasa). [Contribution to the Study of Anti-Infective Value of Typhoid and Cholera Immune Sera.]—*Chugwai Iji-Shimpo* (*Central Med. Jl.*). 1925. Oct. No. 1092. [Summarized in *Japan Med. World.* 1926. Jan. 15. Vol. 6. No. 1. p. 11.]

Gill (C. A.). Cholera in the Punjab in 1925. An Epidemiological Note.—*Indian Med. Gaz.* 1926. Jan. Vol. 61. No. 1. pp. 1–4. With 1 chart in text. [3 refs.] [A Report.]

Mckinsky (R. N.) & Zau (F. D.). Cholera Cases treated in the Municipal Isolation Hospital for Chinese, Shanghai, 1925.—*Nat. Med. Jl. China.* 1925. Dec. Vol. 11. No. 6. pp. 434–439.

Vallipuram (K.) & de Silva (W. R.). Vibrios in Human Excrement.—*Ceylon Jl. Sci.* (Section D. Med. Sci.). 1925. Nov. 18. Vol. 1. Pt. 3. pp. 153–154.

Yamaguchi (Kinji). [On the Relation between the Hemolytic Substances and Agglutinating Substances in the Filtrated Fluids of the Medium cultivated with *Vibrio Cholerae*.]—*Chiba Igakhwai Zasshi* (*Jl. Chiba Med. Soc.*). 1925. May. Vol. 3. No. 3. [Summarized in *Japan Med. World.* 1925. Dec. 15. Vol. 5. No. 12. pp. 359–360.]

PLAGUE.

Fiera (Ernesto Ruberti). Die Pestfälle in Mogadiscio im Jahre 1924 und ihre Behandlung. [**Plague in Mogadiscio in 1924 and its Treatment.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1926. Feb. 1. Vol. 30. No. 2. pp. 51-60.

The author describes an outbreak of plague in Mogadiscio, Italian Somaliland. Fifteen cases are given in some detail and various forms of treatment are discussed. As the result of his experience the author concludes that the first principle of treatment lies in the use of a fresh anti-plague serum combined with injections of camphor-oil, as a heart stimulant, 40 cgm. doses daily subcutaneously for 5 or 6 days. Buboes should be incised when soft and examined for bacilli.

J. H. Tull Walsh.

Crawford (E. J.). **Bubonic Plague with Generalised Eruption.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1926. Jan. 21. Vol. 19. No. 7. pp. 405-406. [1 ref.]

The author describes, from Nigeria, a case of bubonic plague with generalized papular rash on the hands, feet and pectoral region, with a few spots on the back and face. The patient was a young Yoruba woman and the infection was virulent. She died. In smears from the vesicles an almost pure culture of a bacillus showing bi-polar staining with thionin blue, resembling *B. pestis*, was found [*ante*, p. 181 (Kirk) and another reference.]

J. H. T. W.

Jacob (K. K.). **Notes on Pustular Forms of Plague.**—*Jl. Ceylon Branch Brit. Med. Assoc.* 1926. Jan. Vol. 23. No. 1. pp. 31-32.

The author describes two cases: (1) Indian Tamil female; (2) Indian Tamil male; both suffering from plague as shown by symptoms and the presence of *B. pestis*. In both cases vesicles and pustules appeared on the legs and trunk. Both patients died. The author states that he had previously seen a generalized eruption of papules and pustules in a case of bubonic plague sent to hospital as a case of chicken-pox; also petechial eruptions in a case of septicaemic plague. Both these cases proved fatal. Eruptions in plague are very rare. They have no particular distribution. They coalesce and appear in any part of the body at any stage of the disease [v. this *Bulletin* supra; also Vol. 22, p. 773 (Teissier and others)].

J. H. T. W.

Nikanorow (S. M.). Die Rolle der Kamele in der Epidemiologie der Astrachaner Pest. [**The Rôle of the Camel in Epidemiology of Plague in Astrakan.**]—*Cent. f. Bakt.* I. Abt. Orig. 1926. Mar. 1. Vol. 98. No. 1-2. pp. 24-37. With 1 chart in text. [3 refs.]

The author holds that spontaneous plague in camels and their power of transferring the disease to man have been established in the

region of Astrakan. This paper, however, adds little of importance to a former communication (published in another journal) noticed in this *Bulletin*, Vol. 20, p. 359 (NIKANOROFF); see also p. 746 (Titles).

J. H. T. W.

GOSIO (B.). Ueber die Verbreitung der Bubonenpesterreger durch Insektenlarven. [**Spread of Plague by Insect Larvae.**]—*Beihefte z. Arch. f. Schiffs- u. Trop.-Hyg.* 1925. Vol. 29. No. 1. pp. 134-139.

The author describes experiments in which the larvae of necrophilous flies were fed on the liver and spleen of rats or guineapigs which had died of plague. Numerous plague bacilli are found in these larvae. The bacilli pass on to pupa and imago in diminishing number. They do not appear to cause any harm to larvae, etc.; but the author remarks that "during plague epidemics great mortality among flies has been observed." He considers that we cannot ignore such flies as a possible source of infection. [There does not seem to be any evidence of human infection from such a source.]

J. H. T. W.

Comptes Rendus du 5-ième Congrès antipesteux organisé à Saratov par l'Institut de Microbiologie et d'Epidémiologie d'Etat du Sud-Est de l'URSS de 5 à 9 Octobre de 1925. [**Proceedings of the Fifth Anti-Plague Congress at Saratov, Oct. 5-9, 1925.**] In Russian pp. 1-252; 293-301. With 2 maps & 2 plates. [French English & German résumés pp. 253-292.]

Most of the scientific contributions to this Conference, dealing mainly with the biology of the susliks(sisels), their fleas and plague among them, have already been discussed in this *Bulletin*. The Conference dealt with the management of the epizootics and the prevention of human outbreaks. The scheme adopted at the 1924 Conference (this *Bulletin*, Vol. 22, p. 382) consisted in early detection of epizootics and the creation of suslik-free belts round the villages near which rodent disease was found. The results obtained by this method in 1924 were apparently good, only one human case being noted as occurring when work was temporarily interrupted. In 1925 the campaign against susliks was not begun early enough, and epidemics occurred at several places.

Some members of the 1925 Conference doubt the value of the above method; others, though admitting its palliative character, urge its further use. At the same time it was resolved in localities where natural boundaries prevent immigration of the rodents, to start measures for their eradication. Two serious drawbacks in the fight are, here as elsewhere, the difficulty of obtaining sufficient funds and the indifference of the population.

Wu Lien Teh & R.P.

JEFFICHEV. Tri Vspishki Chumi v Zabaikalie v 1924 Godu. [**Three Plague Outbreaks in Transbaikalia during the Year 1924.**]—*Guigiena & Epidemiologia.* Moscov. 1925. Vol. 4. No. 3. pp. 75-79.

This paper contains a short description of three limited human plague outbreaks of tarabagan origin. Of interest is the first of these

manifestations where a man who beat the flesh of an infected marmot with a hammer, in order to serve it as food for pigs, contracted plague presumably in the *pneumonic* form. [This is the first instance of this kind reported from the tarabagan districts, infection from the marmots usually resulting in bubonic plague with a predilection for the axillary regions].

Wu Lien Teh & R.P.

Golov (D.) & Joff (I.). K Voprosu o Roli Bloch Suslika v Epidemiologii Chumi. [**The Role of the Suslik Fleas in the Epidemiology of Plague.**]—*Vestnik Microbiologii & Epidemiologii.* Saratov. 1925. Vol. 4. No. 4. pp. 19-48. With 9 figs. on 2 plates & 1 text fig. [43 refs.]

Studies of fleas of the pouched marmot *Spermophilus mugozaricus*. Two species (*Ceratophyllus tesquorum* Wagner, and *Neopsylla setosa* Wagner) bite man readily, but *Ctenophthalmus breviatus* could not be induced to do so. The authors succeeded in transmitting plague from infected to healthy susliks with fleas (mainly with *C. tesquorum*); infection occurred evidently through the bite and not through faeces. Infected fleas twice were seen to vomit, and plague bacilli were found in the vomitus. The faeces of infected fleas may contain plague bacilli for a considerable time (as observed up to 79 days at a temperature of 7–10° C. and 92 per cent. humidity), though they bit an infected animal only once, and afterwards fed upon healthy ones. The authors suggest that perhaps the fleas and not the susliks themselves might serve as reservoirs of plague.

Wu Lien Teh & R.P.

Gaiski (N. A.). K Voprosu o Vishivaemosti Chumnoi Palochki v Shkurkach Suslika pri ich Chranenia. [**The Vitality of Plague Bacilli on Stored Suslik Skins.**]—*Vestnik Micro-biologii & Epidemiologii.* Saratov. (*Rev. Microbiol, et Epidémiol.*) 1925. Vol. 4. pp. 15-17. [7 refs.] [German summary pp. 130-131.]

As a result of a small number of experiments, the author comes to the following conclusions:

1. The plague bacillus dies on suslik (*spermophilus*) skins kept in the usual stores in less than three days in summer.
2. When exposed to the sun during dry hot summer weather the bacillus succumbs on the skins in less than six hours.
3. Human infection results from contact with living or freshly killed animals.
4. Disinfection of dried suslik skins is superfluous.

[The above conclusions cannot be generalized. In the case of the tarabagan, e.g., another factor has to be considered, because some of the parasites (lice and even fleas) remain for considerable periods of time on the removed skins.]

Wu Lien Teh & R.P.

Nikanoroff (S. M.). Ot Borbi s Chumoi k ej Prophylactiki. [**From the Fight against Plague to its Prevention.**]—*Guigiena & Epidemiologia.* Moscov. 1925. Vol. 4. No. 1. pp. 74-80. With 1 map [3 refs.]

Nikanoroff describes an attempt to control plague among the South-Russian spermophiles (susliks) in a more systematic way than hitherto

adopted. Through a survey covering a large territory and undertaken by six detachments early in spring, the presence of suslik plague was established in two localities. Here besides free vaccination (which was not very popular) and an educational campaign, destruction of the susliks was carried out on a large scale. The results were most satisfactory. Though both localities were within the endemic area and human outbreaks had been frequent in them in previous years, one of them remained free from human plague whilst in the other only one case was noted, occurring at the time when the work was handed over by the health authorities to agricultural experts.

[It may be remembered that a similar plan was recently adopted in the Los Angeles County (California); whenever squirrel plague occurred, the surrounding country was surveyed in order to find the natural boundaries or "squirrel barriers," confining the spread of the rodents in such an area (built-up properties, streams, areas unsuitable for the squirrels, etc.). Starting from the focus of infection and its immediate vicinity, destruction was carried out within the whole area).*]

The results of such systematic campaigns deserve to be watched with interest.

Wu Lien Teh & R.P.

Maruyama (Y.). Nachtrag zu dem Bericht ueber den Bau der Pestbazillen, ihre Katalasewirkung und ihr Reduktionsvermögen. [**Addendum to the Report on the Morphology of Plague Bacilli, their Catalase Action and Reducing Power.**]—*Taiwan Igakkai Zasshi.* (*Jl. Med. Assoc. Formosa*). 1925. Nov. No. 248. German summary p. 4. [In Japanese.]

1. Neither capsule nor ectoplasm are demonstrable, but the membrane can be shown by methylene blue and dahlia staining.

2. The presence of metachromatic granules has no relation to virulence or to type of medium used. They can be made evident in the bacilli after 20 minutes' boiling. These granules are not essential to division nor are they wholly degeneration products; they are rather normal structures, with greater resisting power to injury than the rest of the protoplasm.

3. Plague bacilli contain granules which stain with Sudan III and oxydase granules. They possess rather a large amount of catalase ferment and have reducing powers.

W. F. Harvey.

Colas-Belcour (J.) Valeur du milieu glycériné dans le diagnostic différentiel des cultures des bacilles de la peste et de la pseudotuberculose des rongeurs. [**Value of Glycerin Medium in the Differential Diagnosis of Cultures of Plague Bacilli and Pseudotuberculosis of Rodents.**]—*C.R. Soc. Biol.* 1926. Feb. 5. Vol. 94. No. 4. pp. 238-240. [1 ref.]

It is difficult to distinguish cultures of the plague bacillus from those of *pseudotuberculosis rodentium*. The former does not ferment glycerin while the latter gives rise to much more abundant growth on glycerin

* Dickie, Reports on Plague Eradicative Measures, Los Angeles, 1924–25. Ryan, Paper read at Annual Conference, Californian Health Officers, October, 1925

agar and shows definite evidence in 24 or 48 hours of the production of acid on litmus glycerin agar. The pseudotuberculosis bacillus gives a characteristic chamois yellow growth on potato with green coloration of the medium and renders litmus milk alkaline.

W. F. Harvey.

Kapsenberg (G.). Een toevallige bijdrage tot de epidemiologie van de pest. [**An Occasional Contribution to the Epidemiology of Plague.**]—*Nederl. Tijdschr. v. Geneesk.* 1926. Mar. 20. 70th Year. 1st Half. No. 12. pp. 1187-1190. With 2 text figs. [6 refs.]

A case where great numbers of *Ceratophyllus fasciatus* in a child's bed prevented sleep although they did not bite. The fleas are supposed —though not actually known —to have come from dead rats in a neighbouring garret. The fact that they did not bite almost persuades the author that *Ceratophyllus fasciatus* may not be of the same importance as *Xenopsylla cheopis* in the spread of plague.

N. H. Swellengrebel.

Mc Arthur (W. P.). **Old-Time Plague in Britain.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1926. Jan. 21. Vol. 19. No. 7. pp. 355-371.

This was an informal address, delivered without notes. No references are given, nor any acknowledgement of borrowed material; but the author stated that, with one exception, all the chronicles named or quoted had been read in the original. It is indeed an interesting address and especially because, as the Vice President in the chair remarked, it tells of matters which are not to be easily found in the plague literature of old times.

J. H. T. W.

Wickersheimer (Ernest). Recettes contre la peste, extraites d'un manuscrit du XV^e^ siècle, ayant appartenu à l'abbaye de Maulbronn. [**Prescriptions against Plague, from a 17th Century Manuscript.**]—*Janus.* 1926. Jan.–Feb. Vol. 3. No. 1. pp. 1–7. [15 refs.]

This is a review of a quaint historical record, a manuscript written by Jean de Saxe in the fifteenth century. The remedies are not such as would be used at the present time and some of them must have been very nasty. "Fol. 79v^o^" provides antidotes in Latin verse, Latin which even the dog could read!

J. H. T. W.

Aristarkhova (O.). Etude épidémiologique d'un foyer pesteux au Sud-Est de la Russie.—*Bull. Soc. Path. Exot.* 1925. Oct. 14. Vol. 18. No. 8. pp. 624–628. [2 refs.]

da Cunha (P. A.). Plague at Vasco da Gama. (1923–1924).—*Bol. Ger. Med. e Farmacia.* 1925. Mar.–June. 10th Ser. Nos. 3–6. pp. 49–59.

Ruberti-Fiera (Ernesto). I casi di peste a Mogadiscio nel 1924. Contributo alla profilassi ed alla cura della peste. Nota preventiva.—*Ann. d'Igiene.* 1926. Feb. Vol. 36. No. 2. pp. 94–104. With 2 text figs.

MISCELLANEOUS.

PROCTOR (A. H.). **Differential Diagnosis in the Tropics.**—*Indian Med. Gaz.* 1926. Mar. Vol. 61. No. 3. pp. 105-112. [1 ref.]

A valuable paper which any clinician could consult with profit Colonel Proctor takes up in turn three tropical diseases common in India and describes cases in which they have simulated other diseases, his object being to indicate the protean manifestations of the diseases under review. Later he will apply the method to other tropical diseases.

Malaria. The table will illustrate his method ;

Usual symptoms ..	362	Cholera	1
Anaemia	4	Difficulty of micturition	3
Vomiting	7	Respiratory conditions	12
Gastric pain	6	Collapse	3
Colic	2	Typhoid state	1
Haematemesis	3	Cerebral and nervous	
Diarrhoea and Dysentery	11	symptoms	7
		Jaundice	4
			426

It gives the symptoms originally complained of by patients admitted to hospital ; the special symptoms were the sole symptoms.

A case of " gastric pain " of a month's duration in which the finding of parasites and the giving of quinine gave rapid relief is described ; the author believes the pain in such instances to be splenic in origin. A case of renal colic with haematuria and rise of temperature was treated in the usual way till its recurrence on the two succeeding evenings led to a blood examination ; after quinine the colic vanished ; the suggested pathology is blocking of the renal capillaries by parasites and the passage of blood clots. A Punjabi recruit had symptoms of complete transverse myelitis without fever, deceiving even the elect, but the onset of fever of tertian periodicity gave the clue and quinine supplied the cure. Cases in which the symptoms are those of cholera or collapse are difficult ; the author gives the tip that whereas intravenous injection, the thought of the practitioner rather than blood examination, usually results in cholera in the passage of typical cholera stools and fresh vomiting, in malaria this is not the case. The cases most likely to be overlooked are those of general debility and malaise ; they are readily cured when the diagnosis is made. Among the lessons of the table are : In every case of vomiting take a blood film or at least examine the spleen.

Owing to the taking of quinine before the consultation parasites cannot always be found ; here the quinine test comes in, the rule being that with quinine properly administered a fever lasting more than 4 days is not malarial ; the " properly administered " of the author includes a preliminary mercurial purge. The only trap he knows of in the quinine test is the terminal rise of dengue ; here we have the slow pulse, etc.

Kala azar. Of 150 cases the primary symptoms in 120 were fever and enlarged spleen, and in the remaining 30 one of ten other signs or symptoms. By far the commonest mistake is to diagnose kala azar as enteric, and so alive is the author to this that he inclines to regard

continued fever as kala azar till proved to be enteric. He gives 4 points of difference: (1) the spleen steadily enlarges in kala azar and usually reaches a larger size than in enteric, (2) the patient's general condition is less toxic in kala azar than the duration of the fever would indicate, (3) there is progressive leucopenia and (4) a double rise of temperature in 24 hours; (3) and (4) are the most reliable points. They enabled a case regarded as septic cholangitis to be placed in its true category. Bowel haemorrhage is almost as common in kala azar as in enteric. The author thinks that in von Heyden 471 and urea stibamine we have a valuable therapeutic test. He has not found examination of the peripheral blood of value in diagnosis and he is chary of splenic puncture "unless the spleen is enlarged to a considerable extent and in such cases it would seem hardly necessary." One would conclude that he believes parasitological evidence to be unnecessary but elsewhere he speaks of successful liver puncture. After enteric malignant endocarditis is most commonly confused with kala azar; a cardiac murmur may lead to the belief that the case is one of kala azar arising in chronic heart disease. Cases of fever with haemoptysis, due to Leishmania, have been regarded as tuberculosis and the first case of kala azar shown to the author, in a hospital without microscope, proved to be spleno-medullary leukaemia.

"It has always seemed curious to me that in a country where pathological conditions of the spleen are common, we scarcely ever hear of splenomegaly due to conditions which prevail in Europe. I refer to splenic anaemia, acholuric jaundice and syphilitic disease of the spleen in infants, to say nothing of the rarer Gaucher's spleen and von Jaksh's disease."

[Similarly, where blackwater fever is found one never hears of other kinds of haemoglobinuria and all elephantiasis in *Filaria bancrofti* regions is filarial.] A case of chronic malaria was recently diagnosed as kala azar. The author points out how easily cancrum oris can be arrested in the initial stage. Inspection of the mouth should be made daily in kala azar. If the thin grey line of ulceration on the gum is treated with carbolic acid and spirit it usually clears up.

Amoebiasis. Of acute amoebic intestinal infections 238 were admitted with the "usual symptoms" and 30 with the addition of fever. In 44 the only symptoms were diarrhoea alternating with constipation, in 5 difficulty of micturition and in 5 appendicitis. In cases of alternate diarrhoea and constipation the stools should be emulsified before examination. A good way of obtaining samples of mucus, according to HINGSTON, is to insert a gum elastic Coudé catheter, and turn it round repeatedly; the mucus is caught in the catheter's eye. In urgent difficulty of micturition it is well to remember that the patient forgets to mention his dysenteric symptoms. Appendicitis and dysentery are frequently confused; the order of appearance of symptoms is here of importance: in appendicitis, pain, nausea, local sensitiveness, fever. "Appendicitis appears to be frequent in cases of dengue . . . The association . . . would seem worth investigating." The author has known carcinoma of the rectum treated as chronic dysentery till secondary deposits appeared in the liver.

Of 33 cases of amoebiasis of the liver 14 had the "usual symptoms," 7 fever only and 5 lung symptoms. The greatest aid to diagnosis is X-ray screen examination. A case of cerebral abscess in Calcutta proved to be a pure amoebic abscess; it was missed although there was a history of dysentery.

Some results of treatment. Quinine taken over long periods may give rise to tachycardia. Sudden attacks of syncope may be due entirely to this drug and are treated by stopping it. Nothing would induce Colonel Proctor to have quinine intramuscularly and he gives a list of disasters he has seen; emetine and arsenic have also their tragedies. Finally he discusses the main points that require attention in diagnosis.

A. G. B.

Kopstein (F.). **The Moluccas.**—*Meded. v. d. Dienst d. Volksgezondheid in Nederl.-Indië.* 1926. Pt. 1. pp. 1-78. With 28 figs. on 14 plates, 2 maps & 7 text figs. [3 refs.]

This long paper contains much of general interest that does not require detailed notice. It concerns chiefly the island of Amboyna (called Ambon in the paper) and three small islands adjacent called the Uliassers. The author was commissioned to visit all the villages in these islands to study the conditions of leprosy there and took the opportunity to make trips to other groups. Amboyna contains 50,000 people and the Uliassers 36,000. The primitive types of houses are described: they are made of sago palm leaves and bamboo; earth floors are almost universal and windows very small, points in favour of the survival of lepra bacilli. Clothes are common property of the inmates. The diet consists of sago and fish; milk and dairy products are practically unknown; rice is scarce and little in demand. No precautions are taken about drinking water but dysentery and typhoid are rare. The removal of faeces and refuse is left to the pigs, hens and dogs; ankylostome infection, however, is scarce. Of these islands Amboyna has the highest percentage of lepers and this is important because the Ambonese travel throughout the archipelago as soldiers, teachers and government officials. No effort is made to restrict its spread. In fact, it seems that with the advance of civilization among the natives of the Moluccas the fear of leprosy becomes less. Of 55 villages 33 were found to contain lepers, 299 in all, including 84 in the leprosarium. It is noted that whereas the capital contains 26,000 Christians as against 18,000 Mohammedans, there are 4 times as many lepers among the former as among the latter. The explanation is not apparent. In the other three islands the lepers numbered 163. A comparison of the numbers of cases found by Neeb in certain villages in 1901 shows that the lepers have doubled in 20 years. Leprosy has been known in the Moluccas for over 100 years; the history is given of the measures taken by successive governments.

Yaws is universal and children have it as a rule at an early age. "Leprosy causes much less misery than framboesia." A description of the many manifestations is given with photographs. "The number of those suffering from ostitis and arthritis and of those disfigured by the sinking or loss of the nose is very large." Neosalvarsan is known everywhere and is regarded by the native as a cure for all ills. Of juxta-articular nodules 30 cases were seen in a population of 44,000 persons, chiefly in men "of a mature age." Of dermatomycoses, tinea imbricata, t. circinata, t. albigena, and pityriasis versicolor are prevalent. For tinea imbricata neosalvarsan has worked many successful cures; 241 cases were seen in Amboyna, *i.e.*, in 5·5 per mille of the inhabitants. It is difficult to distinguish tinea albigena from some forms of yaws; here again neosalvarsan is useful.

Scabies is prevalent owing to the communal life. Scabies and pediculosis are the chief causes of the frequency of ulcers and furunculosis. Malaria is endemic on all the islands but is not serious ; 82 per cent of the children of one village had large spleens, but a comparison, over a series of 20 years, of the deaths under one year in this village and another where the splenic index was 6 shows only an inconsiderable difference. The following species of Anopheles were found: "*Myzorhynchus barbirostris*, *Myzorhynchus barbirostris* var. *pallidus*, *Stethomyia aitkeni*, var. *insulae florum*, *Myzomyia rossi*, *Myzomyia vaga*, *Neomyzomyia punctulata*, *Nyssorhynchus annulipes*, var. *moluccensis*. In Ambon and Piru (Ceram) *M. ludlowi*." Blackwater fever does not occur in the Moluccas.

Tuberculosis is met with in all the forms seen in Europe ; acute and chronic consumption, infection of glands, joints, bones and peritoneum ; but is nowhere very frequent.

Of the eye diseases conjunctivitis, met with almost exclusively in children, is the most important ; it is follicular, gets well without treatment and leaves no trace. Nystagmus is frequently met with, more among children than adults. Venereal diseases are rare and venereal granuloma unknown. Beriberi is very rare ; if met with it is in prisons. Smallpox-vaccination is general ; the non-vaccinated are found in the Mohammedan rather than the Christian villages ; only a small proportion is pock-marked. Of mental diseases amok and latah are in Amboyna quite unknown. Malignant tumours seem to be rare but benign tumours, especially lipomas, are frequent. There is a sparse occurrence of amoebic dysentery ; ancylostomiasis and ascariasis are general but of little importance. The last 15 pages are occupied by a discussion of the " population problem of the Moluccas."

A. G. B.

Sciencia Medica. 1926. Jan. 31. Vol. 4. No. 1. pp. 41-50. With 5 figs. Nosso patrimonio scientifico. O Instituto Oswaldo Cruz. [**The Oswaldo Cruz Institute.**]

The first issue of the current volume of this periodical contains a most interesting account of what is now known as the Oswaldo Cruz Institute, its inception, growth, and the character of the work produced by the staff.

Starting in 1899 in a comparatively small way as an establishment for the preparation of anti-plague serum and vaccine, it was designated the Federal Serotherapeutic Institute and placed under the directorship of Dr. Oswaldo Cruz. In 1907 it was transformed into an institute of experimental pathology and renamed the Instituto Oswaldo Cruz in honour of its director. On the death of Dr. Cruz ten years later, his senior assistant, Dr. Carlos Chagas, was chosen as his successor and has more than upheld the reputation of his predecessor.

The Institute is a most imposing building, on a Moorish plan, of five floors ; one for administration and other offices, two for laboratories, director's, secretary's, and lecture-rooms, a fourth for the library and photographic rooms, and the fifth for sleeping accommodation. The library contains over 41,000 volumes and 1,350 scientific reviews, and there is a museum ot entomology, poisonous animals, pathology, macroscopic and microscopic preparations and cultures.

The following subjects are investigated in the Institute : Experimental pathology, hygiene, zoology, veterinary and plant-pathology,

applied physiology and chemistry, preparation of biological products, for treatment, curative and prophylactic, of the diseases of man and of animals, and practical courses are given in parasitology, medical zoology, and microbiology.

A list of some of the most important of the 678 works already produced and recorded is given; among them may be mentioned the treatment of leishmaniases, the discovery of American trypanosomiasis, vaccine treatment of symptomatic anthrax and of fowl spirochaetosis, the preparation and uses of d'Herelle's bacteriophage, antivenin for scorpion stings, and the naming and classification of zoological species found in Brazil.

Workers in tropical and subtropical regions owe a deep debt of gratitude to the founder and staff of the Institute, to which the London School of Hygiene and Tropical Medicine will, we hope, in time prove a friendly rival, for there is nothing in the British Isles at present to compare with it.

H. Harold Scott.

Steudel (Ernst). Die tropenhygienische Auswertung des Lettow-Zuges. [**The Value for the Tropical Hygienist of the Lettow Campaign (East Africa).**]—*Beihefte z. Arch. f. Schiffs- u. Trop.-Hyg.* 1926. Vol. 30. No. 1. pp. 76-80.

The remarkable health record of the Germans who took part in the strenuous campaign under Lettow Vorbeck in East Africa, 1914-18, is discussed. The author would ascribe it largely to the gradually increasing training and to selection, a point which he thinks has been insufficiently stressed. There were at the outset 3,000 Europeans. When the "war of movement" began the sick could no longer be treated in hospital, and were handed over with the severely wounded to the enemy. When in November 1917 the Rovuma river was crossed only 291 of the original 3,000 remained, and this number was reduced 10 months later to 168, and at the armistice to 155. Of the original 63 doctors 13 crossed to Portuguese East Africa, and of the 6 who remained at the armistice 2 were almost incapacitated. It is well, therefore, not to make far-reaching generalizations from this campaign. It does, however, show that there are Europeans who are remarkably adaptable to tropical climate. The freedom from sunstroke may be attributed to the compulsory abstention from alcohol. Nocht and others remarked that the tropical diseases and not the climate were the chief enemy [see also this *Bulletin*, Vol. 15, p. 277].

A. G. B.

Weichbrodt (R.). Beeinflussung der Inkubationszeit bei Infektionskrankheiten. [**The Influencing of the Incubation Period in Infectious Diseases.**]—*Deut. Med. Woch.* 1925. Nov. 20. Vol. 51. No. 47. pp. 1949–1950.

The author, who has taken part in the recent work on the inoculation treatment of general paralysis, has turned his attention to the subject of incubation periods. With the working hypothesis that decomposition of albumen to a small degree cuts the incubation short, and to a larger degree prolongs it, or may prevent infection altogether, he made observations on paralytics under relapsing fever treatment, since with this (in contrast to malaria) the incubation period is a definite one,

lying between 3 and 7 days. The substance used for injection was a suspension of killed X_{19} bacilli. Of this an injection was given intravenously, and the patients were inoculated with relapsing fever, either at the height of the fever or after its subsidence. [number of cases not stated]. The incubation period was now usually 11-15 days and was generally longer in those injected at the height of the fever. In no case was infection prevented by the injection.

He then gave a patient (March 11th) an injection of malarial and relapsing fever blood simultaneously. The first attack of fever occurred 28 hours later, and malarial plasmodia were detected; he concludes that the fever was due to the parasites. The attacks recurred on the 15th, 17th, 19th, 21st, 23rd and 25th, and in this period no spirochaetes were detected though subinoculations to mice were successful. Quinine was then given for 5 days and again for 4. No further malarial attack occurred, but on April 6th there was a rise of temperature and spirochaetes were found, the attacks recurring on the 14th and 23rd and on the 4th and 10th of May. Here the malaria caused a "depression" of the relapsing fever virulence. The experiment, he writes, raises the question whether the action of malaria therapy in paralysis could not be explained by depression immunity, *i.e.* immunity which produces not the death, but a depression of the virulence of the infecting organism.

He notes that Bieling and himself have shown that a rabbit chancre can be cured by a non-specific remedy such as X_{19}. Experiments are to be continued.

A. G. B.

Dürck (Hermann). Ueber die mit herdförmigen Gliaproduktionen einhergehenden Erkrankungen des Zentralnervensystems. [**Affections of the Central Nervous System accompanied with Focal Glia Production.**]—*Beihefte z. Arch. f. Schiffs- u. Trop.-Hyg.* 1925. Vol. 29. No. 1. pp. 43–76. With 36 figs. on 23 plates. [52 refs.]

The author describes three inflammatory processes of glia proliferation that may occur in the brain in malaria, typhus, Chagas-disease, epidemic encephalitis, and pernicious anaemia. The first process, which he regards as defensive—the organism throwing out a living barrier against the entry into the blood-stream of hurtful matter, either living or dead—results in the formation of perivascular nodules of living cells. In the second process the glia-cells proliferate around and phagocytose individual nerve-cells, so that well-defined nodules of glia with a dead core are the result. The third process is a variety of the second; the proliferating glia-cells instead of circumvallating individual nerve-cells spread in ramifying syncytia through the brain, forming a network (Strauchwerkbildung) in the meshes of which the normal histology of the brain is profoundly altered. The article is illustrated by a plenitude of superb plates, of which no less than 10 exhibit various changes observed in malaria brains.

A. Alcock.

Mukherjee (Harendra Nath). **Studies in Blood Chemistry of Bengalee Students—Physiological Normals II.**—*Calcutta Med. Jl.* 1925. Oct. Vol. 20. No. 4. pp. 143–148. [12 refs.]

The normal calcium content of serum being by general agreement between 9 and 11 mgm., and the average inorganic phosphorus

content (adults) approximately 3 mgm. per 100 cc., these analyses of the blood of healthy Bengali students show no appreciable divergence from these figures. The cholesterol content, however, is considerably below the Euramerican standard. Attention is drawn to the possibility of a corresponding deficiency in Bengali diet.

A. A.

Akashi (M.). **Some Clinical Observations.**—*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. Formosa*). 1925. Dec. No. 249 and 1926. Jan. No. 250. English summary pp. 5–6; 7. [In Japanese.]

English summaries of Japanese papers by the Director of the Government Hospital, Tainan, Formosa. Of 100 cases of typhoid 27 had hypertrophy of the liver, but only three symptoms of acute hepatitis; the condition is often overlooked. Many so-called tropical hepatic tumours are, according to the author, malarial. Malarial hepatitis, however, is always mild and suppuration is "extremely rare."

The ineffectiveness of emetine in liver abscess does not exclude the agency of the entamoeba as various kinds of bacilli may accompany it. The author advises the trial of emetine in all cases of acute hepatitis and tropical abscess; one should not proceed to operation till emetine has failed, and even then should continue its use. In the initial stages of tropical abscess of the liver, he says, emetine will cure 50 per cent. of the cases.

A. G. B.

Frankenberger (Charles). **How to Consult the Medical Library and Medical Literature.**—*Long Island Med. Jl.* 1926. Feb. Vol. 20. No. 2. pp. 37–47.

The Library of the Medical Society of the County of Kings on Long Island is the fourth largest privately-owned medical library in the United States, and enjoys also for its Members the privilege of borrowing from the Army Medical Library at Washington which with its 814,796 volumes and pamphlets is the second largest medical library in the world. In this paper the Librarian describes the history, arrangement, classification and cataloguing of the collections under his charge, and indicates how Members of the Society may best use this storehouse of medical literature. Much of the information is applicable to other medical libraries, and by its aid readers should have little difficulty in looking out from the mass of literature the desired references on any specific subject. The more important medical indexes and bibliographic reference helps are set out and explained. For instance, readers wishing to know of the most recent articles on a special subject are referred to the "Quarterly Cumulative Index to Current Medical Literature" published by the American Medical Association. For more exhaustive searches of the medical literature they are advised to consult the "Index Catalogue of the Library of the Surgeon General's Office, U.S. Army" (of which 42 volumes have been published to date), and for the latest references, the complementary volumes of the "Index Medicus" also prepared at the Army Medical Library, and published quarterly by the Carnegie Institution of Washington. These reference works together form the most complete indexes available of the medical literature of the world, and fortunately are to be found in many medical libraries outside the United States. Other publications

and special periodicals providing bibliographies and in some cases abstracts upon the subjects to which they are devoted are also listed in the paper, as are the titles of several useful publications on the composition and writing of medical articles, and on the history of medicine.

R. L. S.

Christopherson (J. B.) & Gloyne (S. Roodhouse). **The Biochemical Action of Intravenous Antimony Tartrate Injections.**—*Lancet.* 1926. Jan. 30. pp. 227–229. [4 refs.]

The authors recall the familiar physiological effects of intravenous introduction of potassium or sodium antimony tartrate—chest discomfort and dry cough, constriction in throat, nausea, colic, desire to micturate and headache or dizziness ; an occasional result is shock due to individual susceptibility or true anaphylaxis ; later, may occur rheumatic pains in the joints and even paresis of muscles, coming on some hours after injection ; later still, skin phenomena, such as a flush round the site of injection, loss of pigment. The symptoms and signs which follow prolonged intravenous injections seem to be typically allergic ; the patient is intolerant of small non-toxic doses.

The authors studied the organotropic effect on man and rabbits. Six patients with intractable psoriasis were treated with success in a few weeks in two instances and ultimate success in the remainder. The authors consider that the drug acts indirectly through its general physiological effect on the body tissues, possibly by some alteration of protein metabolism. They examined sections of the viscera from a man suffering from bilharziasis who died after an accidental dose of 13 grs. of antimony tartrate, and found degeneration and destruction of the parenchyma of liver and kidneys. Four rabbits were inoculated intravenously with varying doses ; the post-mortem changes were—dilatation of blood capillaries, effusions into serous membranes, haemorrhages into lungs and spleen, retention of urine. There was degeneration of the hepatic cells, and to a less extent in the kidney tubules.

A. G. B.

Kuhn (Philalethes) & Schmidt (Hans). Neuere Erfahrungen mit Antimonpräparaten bei Tropenkrankheiten. [**Recent Experiences with Antimony Preparations in Tropical Diseases.**]—*Beihefte z. Arch. f. Schiffs- u. Trop.-Hyg.* 1926. Vol. 30. No. 1. pp. 89–101. [33 refs.]

The authors begin their paper by discussing the drawbacks in the therapeutic use of tartar emetic which have led to the search for a substitute : (1) Administration must be by the intravenous route, which is not always practicable in children ; a large number of injections is necessary ; if the technique is not good unpleasant results follow. (2) The toxic effects, since the course is long and the margin between curative and lethal dose not great ; this may cause interruption of the treatment. (3) An attempt to neutralize the solution brings down a precipitate, and this, if it occurs in the blood, may be the cause of lung complications. (4) The instability of solutions. (5) Resistance to the the drug.

The substitutes studied by the authors are stibenyl, stibosan and antimosan (*ante*, p. 482); in the last the antimony is trivalent, in the others pentavalent. All cure dourine-infected mice with one injection. The margin between the curative and the lethal does is in all much larger than in tartar emetic. They can be given intramuscularly as well as intravenously. The rapidity with which trypanosomes are cleared from the blood of mice varies according as the preparation used is tri- or penta-valent.

The authors review the records of the use of these three drugs in leishmaniasis, malaria, trypanosomiasis, spirochaetosis, leprosy, venereal granuloma, bilharziasis, distomiasis and guinea worm infestation.

A. G. B.

Chopra (R. N.). **A Preliminary Note on the Pharmacological Action of some Organic-Antimony Derivatives.**—*Indian Med. Gaz.* 1926. Apr. Vol. 61. No. 4. pp. 162–164. [7 refs.]

In a previous number of this Volume (p. 482) an account was given of the molecular structure of the three types of antimony compounds now being used in the treatment of Kala azar. Of these the most important are derivatives of *p*-aminophenylstibinic acid. $NH_2 C_6H_4$. $SbO(OH)_2$, in which stability is secured by replacing one of the hydrogens in the NH_2— group by acetyl and inserting a chlorine atom in the *meta* position ("Stibosan"), by replacing one hydrogen atom by glucose (Stibamine glucoside or Neostam), by carbamide (Urea-stibamine) or by carbamide and glucose (Amino-stiburea). A third carbamido-compound is "Novostiburea" whose composition has not been disclosed. The present paper deals with the pharmacological action of (1) sodium antimonyl tartrate, (2) "Urea-stibamine" (3) "Aminostiburea," (4) "Novostiburea" and (5) "Stibosan." All five drugs produce a fall in systemic blood pressure, a rise in pulmonary blood pressure, a depression of the heart's action, an increase in the volume of the spleen and a decrease in the volume of the intestines, kidneys and limbs. The greatest differences are shown in the effect on respiration which is unaffected or slightly increased by 1, 3, and 4, and depressed by 2 and 5.

T. A. Henry.

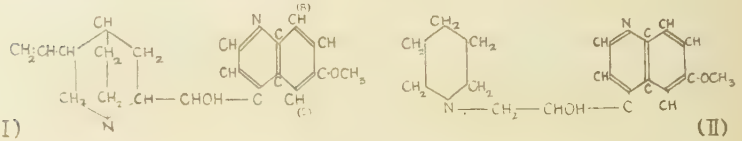
i. Kauffmann. Les alcaloides des quinquinas y leur synthese. [**Cinchona Alkaloids and their Synthesis.**]—*Semana Médica.* 1926. Apr. 29. Vol. 33. No. 17. (1685). pp. 870–874.

ii. Giemsa (G.). Ueber zwei in chemotherapeutischer Beziehung beachtenswerte Derivate des Chinins (Aminohydrochinin, Chitenin-äthylester). [**Two Quinine Derivatives worth Notice Chemotherapeutically.**]—*Beihefte z. Arch. f. Schiffs- u. Trop.-Hyg.* 1926. Vol. 30. No. 1. pp. 62–66. With 2 text figs.

i. After a short résumé of the history of cinchona and quinine, Dr. Kauffmann points out that the earliest efforts to replace quinine by synthetic drugs resulted in the production of antipyrine, thalline, kairine and other substances, useful in their way, but not effective substitutes for the natural alkaloid. He then describes the attempts so far made to associate the specific effect of quinine (and the allied

alkaloids in malaria with some particular part of the known molecular structure (formula I) generally accepted for quinine. This formula can be simplified to Q—CHOH—Q^1, where Q represents the complex bicyclic system, quinuclidine, and Q^1 the quinoline nucleus.

Such substances as optoquin, eucupin, vuzin, etc. are produced from



(I) (II)

quinine by reducing the vinyl group CH_2 : CH. in Q to the ethyl group CH_3. CH_2. and replacing the methoxy group, $C.OCH_3$ in Q^1 by higher alkyloxy groups. The action of these " modified cinchona alkaloids " in malaria shows that the two groups affected by these changes are not specific. Four of the carbon atoms in quinine are asymmetric, but it seems clear that the specific action of the alkaloid in malaria is not dependant on such asymmetry.

The author and others have synthesized substances of the types (A) R—CHOH—Q^1 and (B) Q—CHOH—R^1 where Q and Q^1 are separately replaced by simpler groups, R and R^1 respectively. Type A (of which a complex example " Neoquin " is shown in formula II) has some action in malaria, but is generally too feeble, and too toxic for use ; Type (B) has been made but has not been tried clinically.

ii. Professor Giemsa points out that in the search for more effective drugs in malaria chemotherapeutists have followed three lines of work : (*a*) modification of known cinchona alkaloids, (*b*) synthesis of new drugs simulating, in whole or in part, the structure of the cinchona alkaloids, and (*c*) development of substances, such as methylene blue and the arsenobenzenes, which have no relation to the cinchona alkaloids. Attention is then called to a series of compounds belonging to group (a) prepared by the author with Dr. HALBERKANN. In hydroquinine the vinyl group CH_2 : CH. shown in formula I is reduced to $CH_3.CH_2$—. From this substance aminohydroquinine with the amino (–NH_2) group in the position marked 5 (formula I) is readily produced and from this 5–hydroxy–, 5–bromo–, 5–chloro– and other derivatives are obtainable, and by coupling 5–aminohydroquinone with diazotized *p*-aminophenylarsinic acid a quinine–arsenic compound is obtained in which the group $N:N.C_6H_4.AsO_3H_2$ is attached at position 8 (Formula I).

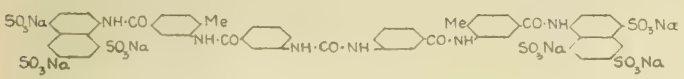
Aminohydroquininine proved less efficient than quinine in malaria : the substances derivable from it are still under trial, but it is interesting to mention that the quinine-arsenic compound appears to be trypanocidal in nagana, a new feature in the action of the quinine series.

When quinine is oxidized by permanganate the vinyl group CH_2:CH, (formula I) is converted into a carboxyl group (–COOH) ; giving rise to quitenine (chitenine), which is without action on malaria parasites. If, however, quitenine is converted into its ethyl ester so that the vinyl group CH_2:CH of quinine becomes $-COOC_2H_5$, the antimalarial action is completely recovered without secondary effects. This preliminary observation opens out many interesting possibilities for future work.

T. A. Henry.

Roehl (W.) Ueber die Wirkungsweise von Stoffen aus der Reihe des "Bayer 205." **Action of Substances in the Bayer 205 Series.** — *Beihefte z. Arch. f. Schiffs- u. Trop.-Hyg.* 1926. Vol. 30. No. 1. pp. 103-111.

As this is a communication from the chemotherapeutic laboratory of the Bayer Co. it may perhaps be taken as an authoritative view of the mode of action of "germanin" or Bayer 205. The molecular structure of the substance is still undisclosed and on this point the author contents himself with the statement that Fourneau regards the drug as the carbamide derived from *m*-aminobenzoyl-*m*-amino-*p* methylbenzoyl-1-naphthylamino-4:6:8-trisulphonic acid, represented by the following formula.



This substance contains none of the metals nor any of the side-chains *e.g.* NH_2-, OH, typically associated with trypanocidal action. It is one of a long series of substances prepared in the research, which culminated in the discovery of "germanin." All these compounds are closely related, but some of them are spirillicidal and others trypanocidal and a slight change in structure may mean transference from one group to the other. The only difference traceable between the two series is that the spirillicidal group yields insoluble, and the trypanocidal group soluble salts with the alkaline earth metals, especially barium.

The rule is not absolute, but is wide enough in applicability to be useful, and it is suggested that the therapeutic action of these substances depends on their capacity for combining, through their sulphonic acid (HSO_3) groups, with basic constituents of the parasitic protozoa. A simple carbamide of 1-naphthylamine-4:6:8-trisulphonic acid exhibits trypanocidal action, but to secure lasting effect the molecule must be enlarged to produce a substance having the requisite physical condition to remain for a long time associated with the proteins of tissue cells or blood serum, and so maintain a concentration fatal to the parasites.

It is conceivable that there may be optimum molecular structures of this type for different species of animals since the holding capacity of these protein materials may vary with the species. This fixation theory implies that there is no toxiphore group in "Bayer 205" and the allied substances, and that they act merely by combining with basic protein components of the parasites, possibly the chromatin of the nucleus, preventing reproduction and gradually exhausting and killing the parasites, and a number of observations supporting this view are given. The fact that trypanosomes can become "fast" to these compounds is explained by assuming a change in the character of the protein components of the parasite; hence the suggestion to use in such cases a toxiphore substance such as antimony, or another and possibly less efficient member of the "germanin" series.

T. A. Henry.

Makarowa (Julia) & Zeiss (Heinz). Kolloidchemische Bindungsreaktionen von Germanin an Eiweisskomplexe. I. Bayer 205 im Toxin-Antitoxin und Anaphylaxieversuch. **Effect of Germanin or Bayer 205 on the Toxin-antitoxin Combination and on Anaphylactic Shock.** —*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1926. May 5. Vol. 47. No. 2. pp. 110–115. [11 refs.]

Bayer 205 alters all the characteristic properties of colloidal protein. The examples given are :—

(1) Anticholera serum is deprived of its power of preventing growth of cholera vibrios.

(2) The diphtheria toxin-antitoxin mixture, which should give rise to flocculation does not do so. A neutral toxin-antitoxin mixture, which should be harmless on inoculation into animals, becomes lethal to the animal after treatment with 2 per cent. Bayer 205.

(3) Anaphylactic shock in guineapigs is prevented by the addition of 2 per cent. Bayer 205 to the shock dose of serum.

W. F. Harvey.

Pacheco (Genesio). [In Portuguese & English.] Estudos sobre a acção dos colloides metallicos an immunidade. [**Studies on the Action of Metallic Colloids on Immunization.**]—*Mem. Inst. Oswaldo Cruz.* 1925. Vol. 18. No. 1. In Portuguese pp. 81–117. With 12 charts on 6 plates. [99 refs.] In English pp. 119–149.

The literature on the subject of the effect of metallic colloids in regard to their bactericidal action and action on the living organism is referred to in some detail. The animal experimental work appears to show that intramuscular injection of colloidal silver or rhodium tends to cause decrease of normal agglutinins, increase of artificial agglutinins, and, in general, reduction of antitoxic power.

In human beings immunized by vaccines the result of injection of colloids was on the whole to bring about reduction of agglutinins.

Twelve patients suffering or convalescing from typhoid or paratyphoid fever were the subjects of trial of the effect of intravenous injection of colloids. Two of these were reserved as controls. The conclusions drawn are, that the injection of colloid itself causes febrile reaction, that specific agglutinins if present are increased, and that there is no effect on the development of the infection.

W. F. Harvey.

Fiallos (Juan Manuel). **Observations on Castellani's Fermentation Phenomenon.**—*Jl. Trop. Med. & Hyg.* 1925. Dec. 1. Vol. 28. No. 23. pp. 426–427. With 1 text fig. [1 ref.]

The experiments given are in confirmation of the work of Castellani (*ante*, p. 214). Organisms such as *B. typhosus*, *B. dysenteriae*, *B. morgani* can be made, under certain conditions, to produce gas when grown in carbohydrate media. The conditions are stated as :

" Two bacilli, neither of which causes production of gas in certain carbon compounds, may do so when artificially mixed together provided one of them is capable of producing simple acidity (never gas) in those carbon compounds and the other, though inert on those carbon compounds (viz., does not produce in them either acidity or gas) is capable of producing gas in glucose."

W. F. Harvey.

Neumann (Franz). Ueber Geisseldarstellung bei Mikroorganismen im Dunkelfeld, mit Lichtbildern, mikrokinematographischen Demonstrationen von Infusorien, Trypanosomen und Bakterien, sowie Lebendvorführung begeisselter Proteusbazillen. [**Flagella of Microorganisms in Dark Field, Microcinematographic Demonstrations of Infusoria, Trypanosomes and Bacteria, Demonstration of Flagellated Living** *Proteus* **Bacilli.**] *Beihefte z. Arch. f. Schiffs- u. Trop.-Hyg.* 1926. Vol. 30. No. 1. pp. 125–132. With 9 text figs.

Although the cilia and flagella of living flagellates and infusoria have been demonstrated with comparative ease, this has not been the case for bacteria in dark fields. Neumann has succeeded in overcoming the difficulty. He uses filtered, absolutely clear gelatine solution, or a filtered, clear gum arabic solution for the suspension of the bacilli, together with a condenser which gives a thoroughly good dark field contrast. It is only the longer bacilli which show well-extended, well-separated lateral flagella in dark field. *B. proteus* is a good example. Flagella which have been shed show an extraordinary resemblance to spirochaetes.

W. F. Harvey.

Kuhn (Philalethes). Demonstration der Ergebnisse morphologischer Bakterienstudien und zum d'Hérelleschen Phänomen. [**Morphological Studies of Bacteria and the d'Herelle Phenomenon.**] — *Beihefte z. Arch. f. Schiffs- u. Trop.-Hyg.* 1926. Vol. 30. No. 1. pp. 133–143. With 10 text figs. [8 refs.]

The author has applied the more delicate methods of protozoology to the fixation and staining of bacteria in cultures, thus :—

(1) Cut a square of culture out of an agar plate with a sterile knife ; (2) place on it a thoroughly clean sterile coverglass ; (3) lay the piece of agar culture on 2 glass supports in a fixing dish ; (4) run fixing fluid, such as bichromate-acetic acid, underneath it ; (5) allow the fixing fluid to act for 10–15 min., for a piece of agar 2 mm. thick ; (6) pipette off the fixing fluid and replace it in turn with 75, 50 and 25 per cent. alcohol until the alcohol shows no yellow colour ; (7) pipette off the alcohol ; (8) place the whole fixing dish in a moist chamber and leave for several hours or till next day, by which time the bacteria will have become fixed to the coverglass ; (9) lever the agar off the coverglass with a knife ; (10) place the cover-glass, film downwards, in the solution : Giemsa 12 drops, 1 per cent. pot. carbonate 2 drops, distilled water 10 cc. ; (11) stain for 16 hours at 50° C. with one change of staining solution ; (12) differentiate well in acetone ; (13) mount in canada balsam.

Among the bacilli are invariably found peculiar forms which, soon after sowing, are already half the size of the bacteria and can attain an extraordinary size : there are round, oval, extended, and angular forms. They multiply by schizogony and possess a nucleus of quite simple form, and send out amoeboid processes of the most varied character. On account of the resemblance of these structures to amoebae, Kuhn called them at first A forms. With Zettnow's flagellar stain they show slender and thick thread-like projections which intertwine and form tangled masses. The schizonts soon show differentiation into two kinds, one taking Giemsa stain strongly and the other weakly. These unite sexually to form a zygote in which differential details soon

appear. The polar chromatophilic portion forms a large number of granules, which ultimately become free by disintegration of the surrounding structure. The granules grow in size at the expense of the bacteria and attain to that of the original form. The phenomena here described are regarded as representing the cycle of development of a micro-organism to which the name *Pettenkoferia* is given. The growth of the organism at the expense of bacteria is identified with the d'Herelle phenomenon. The author is not certain of the systematic place of his organism, but it is closely allied to the chlamydozoa, or at least to rhizopod-like organisms.

W. F. Harvey.

Lindsay (Janvier W.), Rice (E. Clarence) & Selinger (Maurice A.). **A Plea for a Standardized Method of estimating and reporting Hemoglobin Values.**—*Jl. Lab. & Clin. Med.* 1926. May. Vol. 11. No. 8. pp. 737–741. With 3 charts in text. [8 refs.]

An average quantity of haemoglobin, 15 gm. per 100 cc. blood, is given by the Sahli-Leitz, Dare, and Newcomer haemoglobinometers as 100, 109, and 88 per cent. respectively. It is not easy for the practising physician to appreciate the identity of these percentage values. Instruments as supplied by manufacturers are often imperfectly standardized and results obtained with different instruments may show marked variations from the normal. Wong's method is available as a comparatively simple method of standardization for the physician to apply to his own haemoglobinometer. The authors suggest that haematologists should make a practice of reporting the haemoglobin content of the blood in grams per 100 cc. as well as per cent. and that 14 to 17 gm. per 100 cc. should be taken as the normal limits. They recommend the haemoglobinometer devised by Newcomer, using a standardized glass colour plate, as the most accurate instrument for clinical work.

W. F. Harvey.

Müller (H.). De miltscheuring, hare pathologie en forensische beteekenis. [**Rupture of the Spleen, its Pathology and Forensic Significance.**]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1926. Vol. 66. No. 1. pp. 24–51. [124 refs.]

After a critical review of many cases published as such, the number of possibly spontaneous ruptures of the spleen remains surprisingly small. Müller was unable to find more than 10 in which the rupture could not be ascribed to some sort of violence.

There was confusion about this subject in the older literature, caused by incorrect use of the term "spontaneous," but recent writers with practical unanimity deny the occurrence of spontaneous rupture of the spleen. Müller himself saw 44 cases of rupture in 3 years, in all of which traumatic influences were the ultimate cause. Enlargement of the spleen predisposes to rupture of the organ, but such enlargement is not invariably of malarial origin. The pathologic anatomy of the spleen is discussed in some detail. The larger the spleen, the easier it breaks, partly owing to its unprotected situation, if protruding to some extent from under the costal arch. Lesions by *contre-coup* apparently occur. The violence leading to the rupture generally speaking cannot be described as slight.

W. J. Bais.

i. Radsma (W.). Over de methodiek en de toepassing van het meten der alveolaire koolzuurspanning. [**On the Methods and their Application in Measuring the Alveolar Carbon Dioxide Tension.**]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1926. Vol. 66. No. 1. pp. 80–94.

ii. ——. Over de dagelijksche schommelingen van de koolzuurspanning in de longlucht bij de bewoners der tropen. [**On the Daily Oscillations of the Carbon Dioxide Tension in the Pulmonary Air in Inhabitants of the Tropics.**]—*Ibid.* pp. 95–111. [9 refs.]

i. This is a purely physiological article which should be consulted in the original by those interested in the matter.

ii. By application of the technic described in the previous article the author succeeded in showing daily oscillations in the carbon dioxide tension of the alveolar air, which results he summarizes as follows :

1. The curve in the tropics is different from that in Europe.

2. A distinct, sometimes important lowering appears during the morning hours, 1½–2 hours after sunrise, a typical increase in the afternoon, about 1½ hours before sunset.

3. It is very likely that these oscillations are due to direct influence of the sunrays on the body.

4. Eijkman's respiratory metabolism experiments, taken at an average air temperature of 26·7 ° C., are to be completed by similar tests, later in the day in surroundings of higher temperature.

5. The pulmonary ventilation is increased during the tropical day.

W. J. Bais.

REVIEWS AND NOTICES.

BEIHEFTE ZUM ARCHIV FÜR SCHIFFS- UND TROPEN-HYGIENE. 1926. Vol. 30. No. 1. pp. viii.+240. With 61 figs. & 5 curves. Arbeiten aus dem Gebiete der Tropenmedizin herausgegeben von der Deutschen Tropenmedizinischen Gesellschaft. [8 Tagung, 1925.] [**Works on Tropical Medicine presented at the Eighth Session of the German Society of Tropical Medicine.**] 1926. Leipzig: Verlag von Johann Ambrosius Barth. [Price 9 Rm.]

The German Society of Tropical Medicine has just completed the twenty-fifth year of its existence; it has a roll of 278 members, among whom are to be found the most distinguished German authorities on Tropical Medicine. This supplement to the Archiv. f. Schiffs- u. Tropen-Hygiene contains the proceedings of the Society at the meeting at Hamburg in October 1925, under the presidency of Professor B. NOCHT. There are 27 articles or descriptions of demonstrations, some of which are reported in full, and others in a summarized form; together, they cover a large part of the whole field of Tropical Medicine.

Professor NOCHT has given a very interesting, though short and general account of the observations he made during the travels of the Malaria Commission of the League of Nations, of which a fuller report has been published already.

In another paper, it is rather startling to find Professor PLEHN considering the possibility of immunizing emigrants to the Tropics, before they leave Europe, against malignant tertian malaria, by repeated injections of malarial blood, the effect of which he claims to be able to moderate and control by the administration of small doses of quinine. His suggestion was adversely criticized in the discussion that followed the reading of his paper. Dr. P. H. VAN THIEL took up the subject of Professor ROUBAUD'S theory of structural modifications in the zoophilic, misanthropic races of *Anopheles maculipennis*: the author's observations give no support to this idea.

Professor Ernst STEUDEL'S paper on the hygienic aspects of the experiences of the German troops in East Africa during the war, and the subsequent comments on it, present many points of interest. They may be summarized in the statement that, although there are some Europeans who are naturally very highly adapted to a tropical climate, there are very few who can endure the unavoidable exposure and hardships that were the lot of these men. Originally, in 1914, there were 3,000 Europeans in the army; at the armistice only 155 remained, the others having died from wounds or diseases, or having been taken prisoners. It is worth recording that no cases of sunstroke occurred.

Professor FULLEBORN gave demonstrations of the migration of *Ascaris* larvae in the body of the host, and of cutaneous reactions in *Strongyloides* infections.

Dr. C. B. HUPPENBAUER spoke very enthusiastically of the merits of Yatren-105 therapy in amoebic dysentery.

A recommendation has been sent to the League of Nations, by Dr. C. W. F. WINCKEL, that an international survey be made of the distribution of yaws, and that the disease be stamped out by means of salvarsan injections, as was done successfully in Java. He appears to have overlooked several obvious objections to this proposal, and, among them, the obstacle presented by the high price of the drug.

Professor H. WERNER'S paper on Trench Fever compares the results obtained by the British, American and German investigators during the war. He considers that the disease was known of old, and quotes the saying of an anonymous author of the twelfth century: "Aut habet aut fingit quintanae frigora febris."

There are useful articles on the prevalent diseases of the west coast of Colombia and of Central America by Dr. Carl WESTPHAL and Dr. Hans ZSCHUCKE.

A very unusual case is described by Professor Victor SCHILLING and Herr WISCHEROPP. It is that of a man who clung to a plank for four-and a-half days, after his ship had foundered in a typhoon. Apparently as the result of this exposure to sun and wafer, he suffers from a patchy skin-eruption, a mask-like expression of the face, Raynaud phenomena, hypersensibility of parts of the skin, cardiac disturbances, and a strange loss of the power of regulation of the body-temperature; in this last respect, he behaves very like a poikilothermic animal. Neither Professor SCHILLING, nor any of those who discussed the diagnosis, were able to account for this condition.

The German Society of Tropical Medicine is to be congratulated on the high standard of the work presented at this meeting.

H. J. Walton.

Journal of the Port-of-Spain Medical Society for 1924. 120 pp. 2 figs. 1926. Trinidad: Govt. Printing Office.

In deciding to publish its proceedings, the Medical Society of Port of Spain has taken a step which renders a service to the readers of the Journal and at the same time is likely to be a stimulus to the Society's members.

There has been talk of a West Indies medical journal, but in the meantime difficulties of communications between the islands and other hindrances have prevented the maturing of the idea, and the Port of Spain Society is to be congratulated upon having launched its own publication. The first number contains an inaugural address by the Surgeon-General of Trinidad, papers on hookworm, diabetes, leprosy, spinal anaesthesia, typhoid inoculation, Dreyer's defatted vaccine, and clinical notes and memoranda; it is by no means of exclusive tropical interest, but ranges over the whole field of medicine and surgery. We wish the Society and its Journal success.

J. F. C. H.

BERTWISTLE (A. P.). [M.B., Ch.B., F.R.C.S.Ed.] **The Doctor's Books.** 31 pp. With 3 figs. 1926. London: John Bale, Sons & Danielsson, Ltd., 83–91, Great Titchfield Street, W. 1. [Price 1s. 6d.]

This little book, the preface states, describes a simple practical method of book keeping, primarily for doctors who keep their own books; the special feature is the Case-Book, the analysis of which may be of great service to scientific medicine since here are recorded the early signs and symptoms. As regards the financial books the system for the purpose stated would work well. It is single-entry, so that there would be no check on the accuracy or honesty of the book-keeper where one is employed; e.g., moneys recorded in the day-book might not find their way into the Cash Book. However, with a very little more elaboration the system could be made quite sound by converting it into a Double Entry system, which would provide an efficient check. The treatment of returns on a *cash* basis only, advocated by the author, while simplifying it in some cases, would give a very curious result in the case of a new practice, where the doctor only renders his accounts half-yearly. The treatment of Bad Debts need not present any serious difficulty as he seems to imagine.

C. N. R.

ZDRODOWSKI (P.). Le paludisme à Mougan (Transcaucasien). L'étude épidémiologique et le plan de la lutte antipaludique. [**Malaria in Mougan (Transcaucasia). Epidemiological Study and Plan of Anti-Malarial Campaign.**]—174 pp. With 13 figs., 6 plans & 1 map. 1926. Moscow–Bakou. [In Russian.]

This publication presents a detailed report on the epidemiology of malaria in the region of Mougan, in the eastern part of Transcaucasia (republic of Azerbaidjan) based on the results of an expedition in 1925 by the author and his collaborators. The first four chapters are devoted to the geography, climate and hydrography of the country. In the fifth chapter a description of the local mosquitoes and their biology is given. The following are the anophelines recorded from Mougan : *Anopheles maculipennis, A. elutus, A. pseudopictus, A. superpictus, A. pulcherrimus* ; several forms of *Aëdes* (not specified, but one, labelled *Aëdes* M., being regarded as a new species). Chapter six deals with the incidence of malaria. In the course of the survey, 9,494 persons (1,592 Russian settlers and. 7,902 native Turkomans), constituting 52 per cent. of the total population, were examined. The spleen index was found to vary from 28·1 to 96 per cent., whilst Ross's index was from 1·4 to 5·5. Microscopical examination revealed parasites in about 32 per cent. of examined cases in the northern section of Mougan, and about 5 per cent. in the south. All the three species of parasite were represented, benign tertian and quartan being predominant. The remaining part of the report contains recommendations for an anti-malarial campaign in this region.

C. A. Hoare.